IRON & COAL

THE IRON AND COAL TRADES' REVIEW

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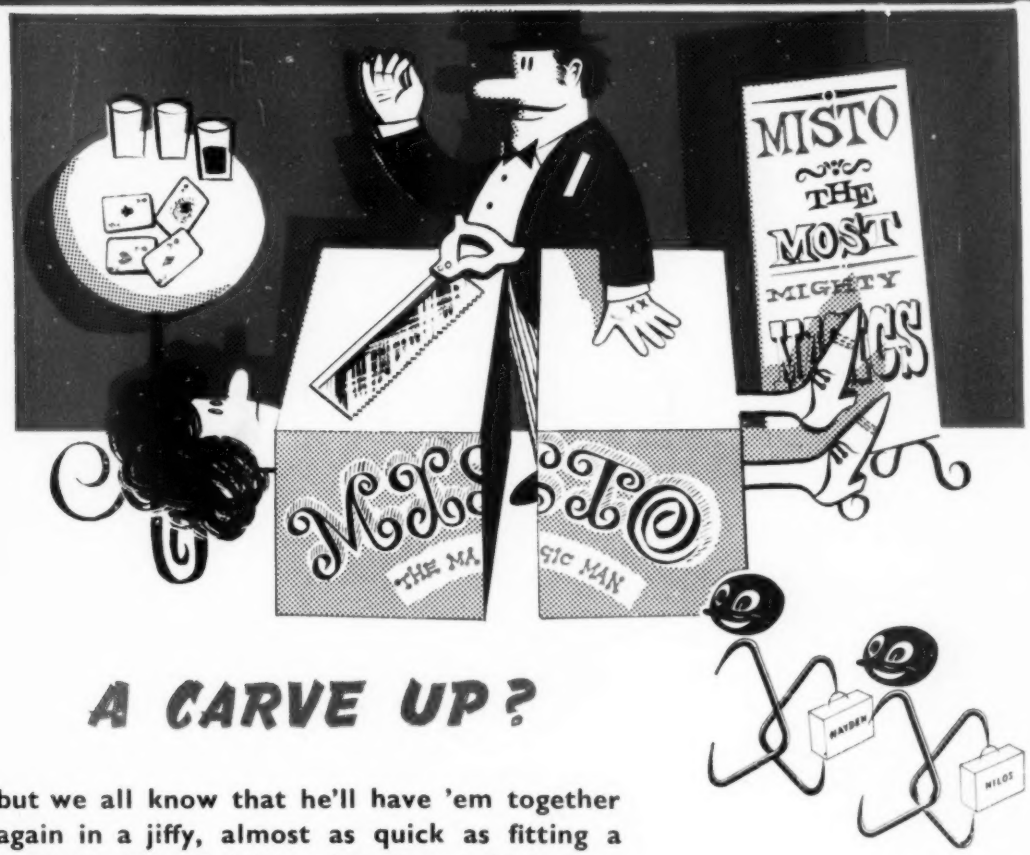

A CARVE UP?

but we all know that he'll have 'em together again in a jiffy, almost as quick as fitting a "Hayden-Nilos" joint with the world famous ZIPPER machine. Any illusions previously held on the difficulty of fitting a belt joint under any conditions are dispelled by this unique machine.

HN594

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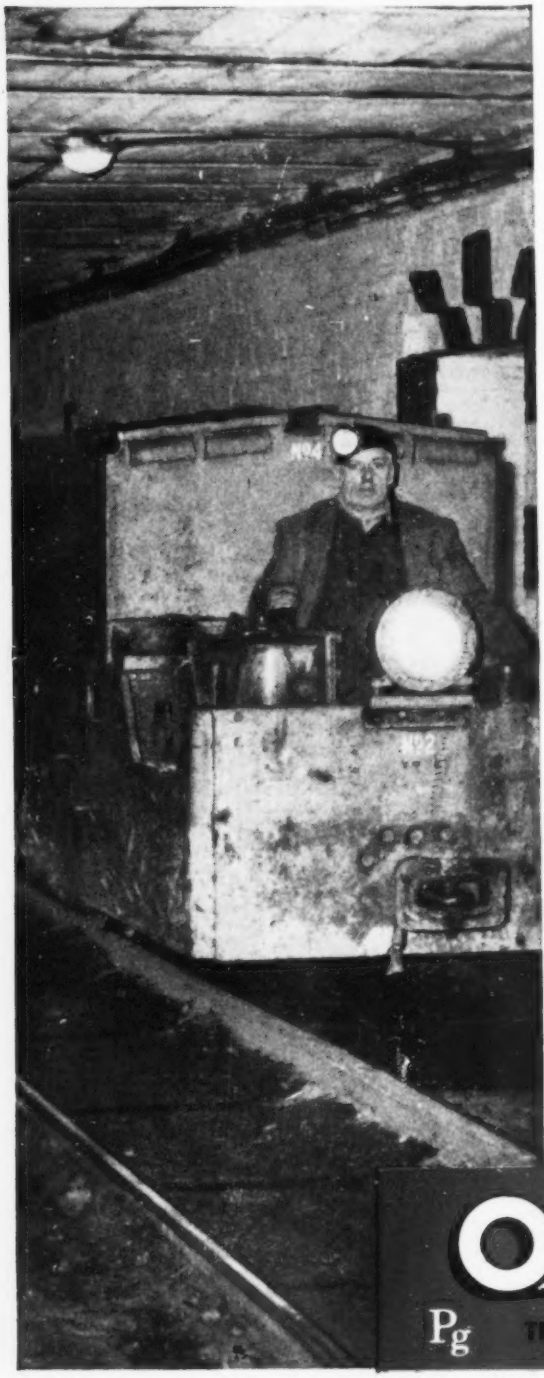

Pg*

MEANS CHEAPER HAULAGE —LONGER SHIFTS

with the first and only 'Double-Sleeve' Long-Life Battery

Until now, many mines have been unable to take full advantage of battery-electric haulage. Today, since the introduction of the greatly advanced Oldham 'Pg' battery, they have gained the double benefit of cheaper haulage and longer battery shifts.

Greater Capacity. Where an ordinary battery is incapable of lasting the necessary period, the exceptionally efficient power/weight ratio of the Oldham 'Pg' battery enables it to work a complete shift without tiring and often continue beyond if required. This greater capacity is due to the much bigger quantity of active material packed into the 'Pg' plate.

Longer Life. The 'Pg' plate incorporates woven glass fibre sleeves, into which the active material becomes firmly embedded, completely eliminating 'shedding'. In addition, physical working stresses are absorbed by the exclusive 'Pg' outer plastic sleeve. These two factors both contribute to the very long working life of the Oldham 'Pg' battery. If you are facing a haulage problem now, or anticipate one, ring or write to us and arrange for an Oldham consultant to call and discuss how 'Pg' can help you.

'Pg' Cap Lamp Battery. The advantages of 'Pg' have been applied to the 'Oldham 'Cap Lamp. In addition to improved efficiency and longer life, 'Pg' means *safer* working, as it gives the wearer brighter light at the end of the shift, when accidents are more likely to occur through fatigue.

I told 'em—OLDHAM'

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***'Pg' also means PLASTIC-plus-GLASS, the first and only 'Double-Sleeve' tubular battery plate.**

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SPEEDY TUNNELLING

WITH THE SAMSON LOADER

(Top) *Samson loader model MC3 with straight jib, after cleaning up the face of the drift.*
(Bottom) *The loader drawn back from the face.*

In spite of the large size of this Yorkshire drift—16 ft. by 12 ft. finished—
it was driven at unusually high speed and high rate of cubic yards per manshift.
In this a leading part was taken by a Samson Loader.
Its firmness in loading, smoothness in moving, lightness of control,
simplicity and strength, make the Samson the loader for high performance in coal or stone.

N.C.B. photos, by kind permission

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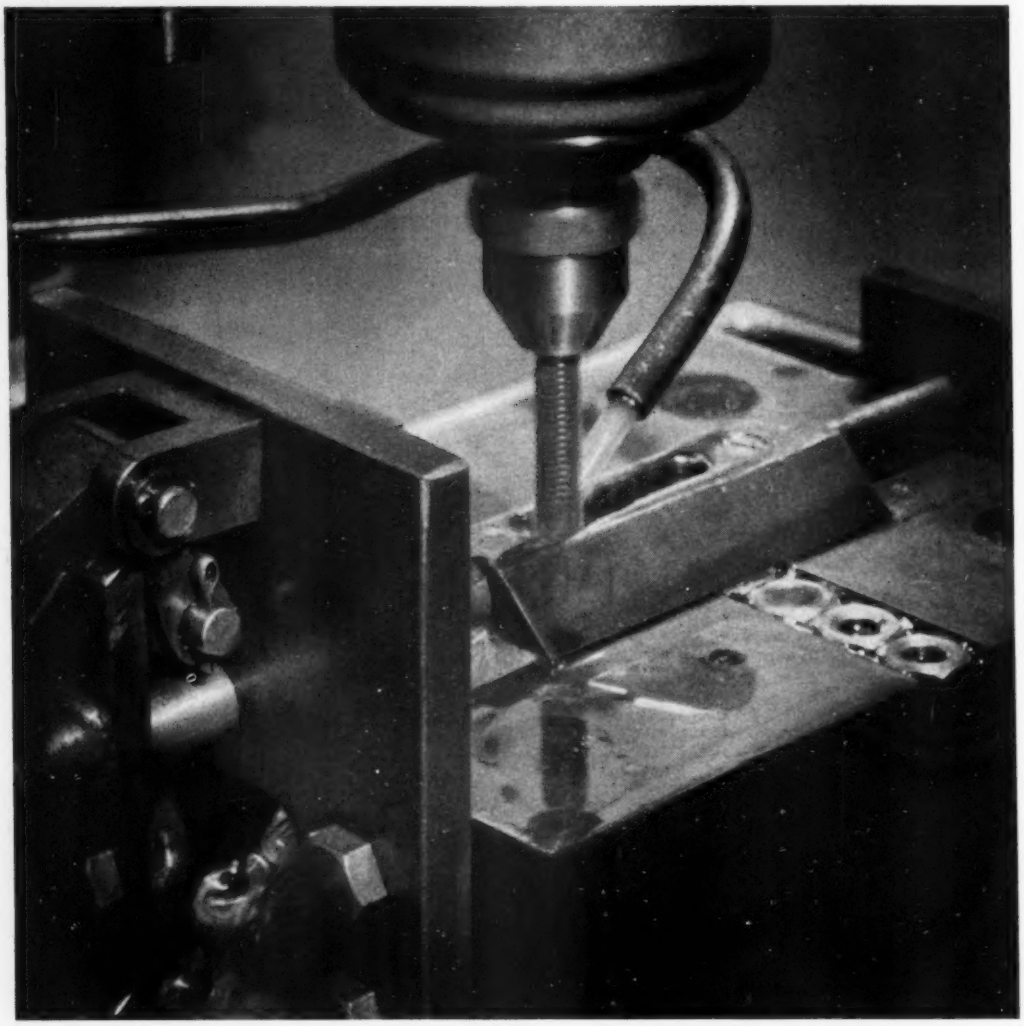
Shell achievement



A famous aero-engine firm found it could drastically reduce the cost of producing nuts made from S.62 steel, by changing over from conventional cutting oils to Shell Garia Oil 115. The facts are these. S.62 steel is heat-resistant and stainless. The quality of this steel and the call for very fine tolerances, as well as a very high percentage of full depth of thread, presented costly manufacturing problems. The breakage of taps, the need for constant re-setting, and the high proportion of rejects, built up the average cost of the nuts to over 1/2d. each.

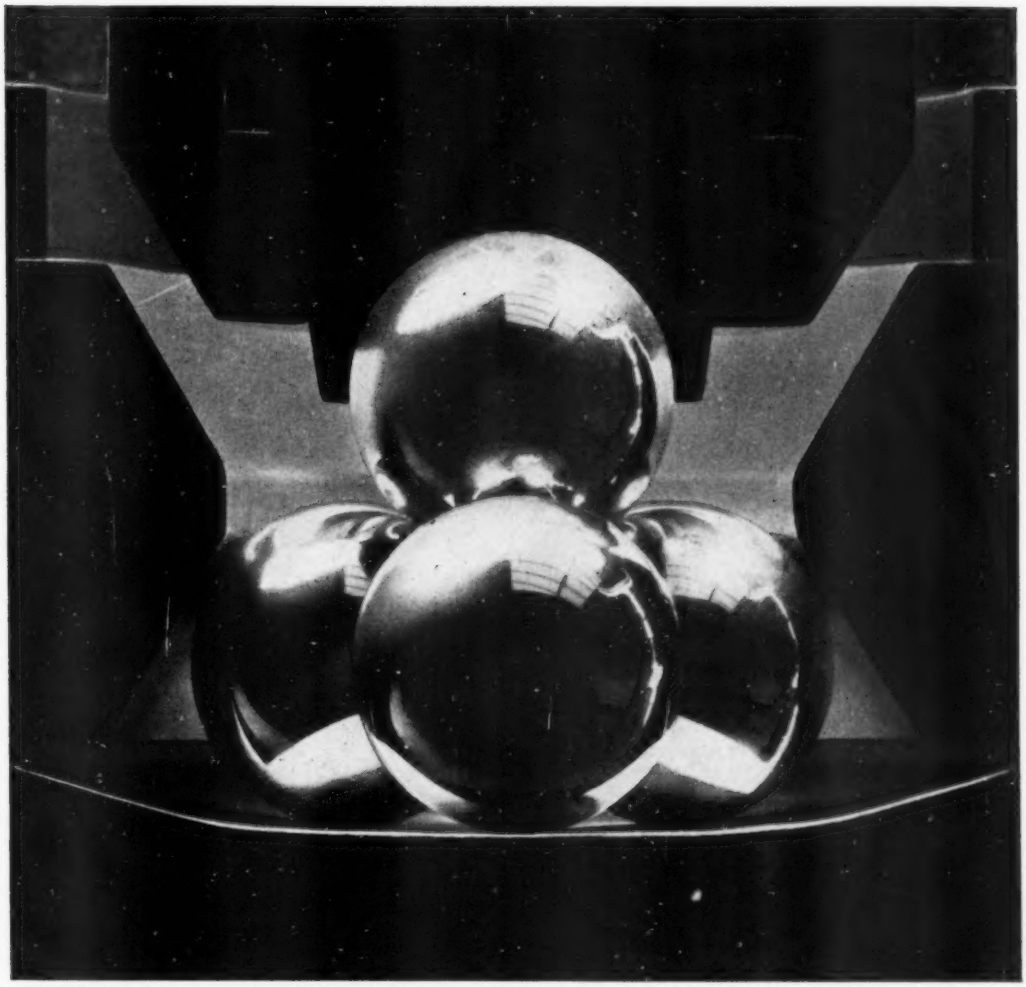
By accepting the advice of the Shell engineer and changing over to Shell Garia Oil 115, this firm was able to produce 3,000 nuts between regrinding taps – resulting in the cost of each nut being reduced to 3d.

Write for the booklet 'Selecting Your Cutting Oils' to Shell-Mex House, London, W.C.2

SHELL

SHELL INDUSTRIAL OILS

Shell demonstration



To establish *facts* is the constant preoccupation of Shell research. Assumptions cut no ice.

For example, how 'extreme' is 'Extreme' Pressure? To evaluate scientifically the respective performance of the many E.P. agents evolved, Shell devised the Four Ball Test machine illustrated. In this apparatus a clamped ½" diameter steel ball revolves in contact with three identical static balls in a metal cup containing the additive to be tested. Pressure between the balls can be varied at will. Under these controlled rubbing conditions, coefficients of friction can be plotted against load. With increasing loads, wear scars formed at successive stages may be measured and the welding point accurately determined. Developed for basic research, the Four Ball Test also plays an important workaday role in ensuring consistent batch quality—of prime importance on the machine-shop floor. Thoughtful production executives who want to know more have only to write for the book.

'Selecting Your Cutting Oils', to Lubricants Dept., Shell-Mex House, London, W.C.2.

SHELL

SHELL CUTTING OILS

LINDLEY

WATER LEAKAGE ALARM METER

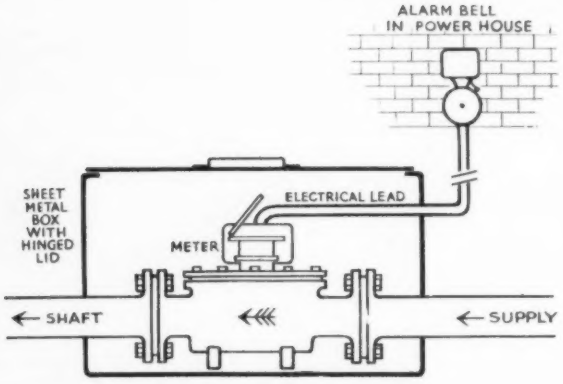
Designed for installation in the water main between lodge and shaft to show when leakage occurs underground and to measure the amount of such leakage.

Any leakage to the extent of 10 gallons will operate the alarm bell (Preferably situated in the power house).

Alarm operates independent of rate of flow: e.g.

Flow of:	*Alarm operates:*
5 g.p.m.—	every 2 min.
10 g.p.m.—	every 1 min.
100 g.p.m.—	continuously

SIZES AS REQUIRED



For normal working during pit hours the alarm must be disconnected and switched on again when work has ceased underground. The meter will still register the amount of water being used underground when alarm is disconnected.

This apparatus has been proved fully efficient under working conditions and is recommended for use in conjunction with

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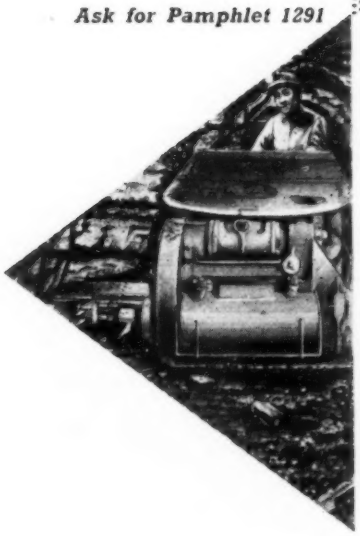

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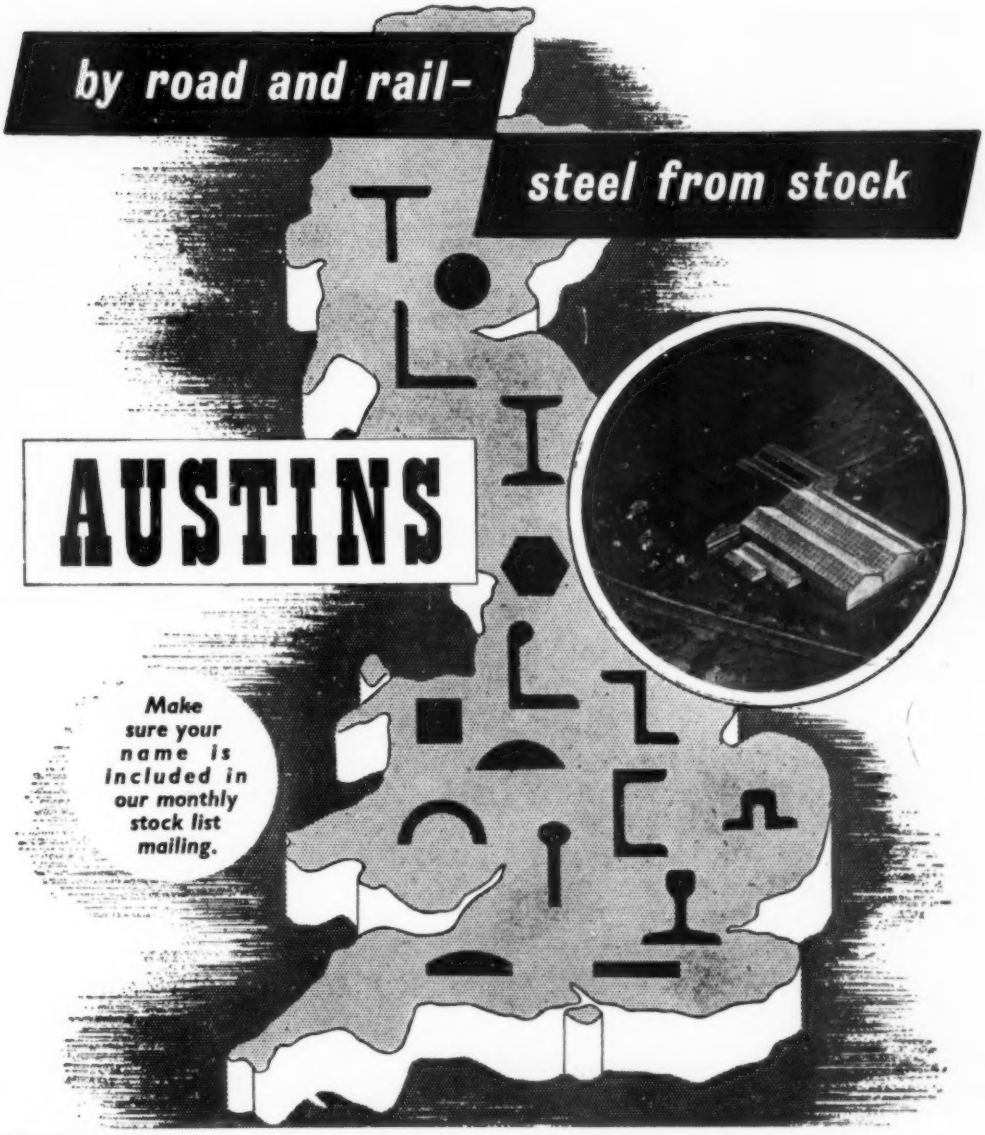

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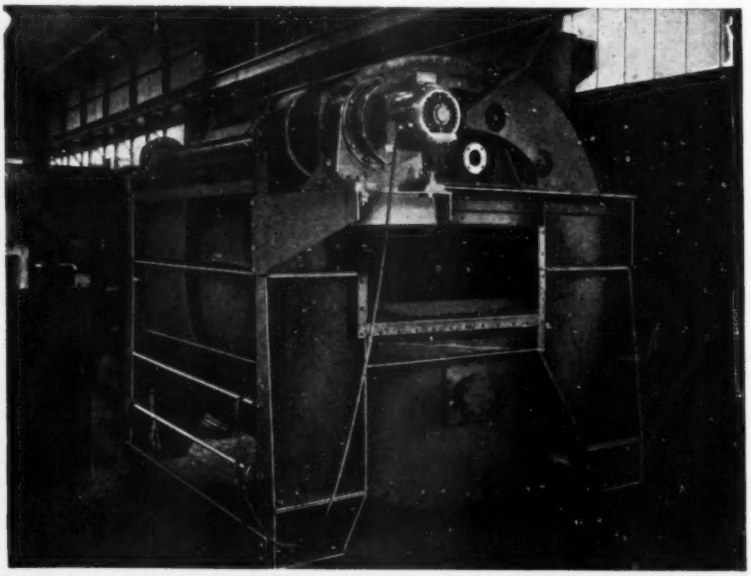

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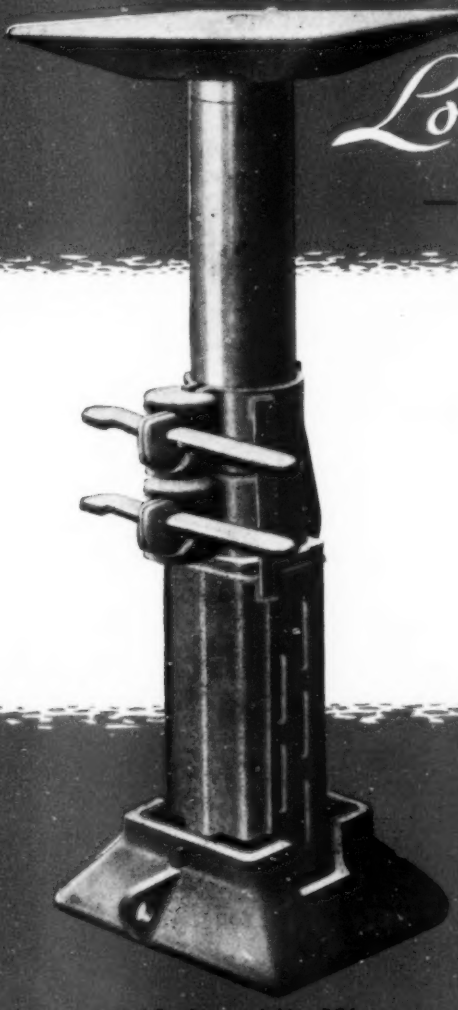
(SCHWARZ PATENT)



N.C.B. Approval No. PC4.

The design of the Huwood Chock has been streamlined in recent months to give greater ease of handling and improved performance. It is an ideal goaf side support in all face conditions and can be relied upon to function satisfactorily with the minimum of attention. It is a chock every colliery can afford—and few can afford to be without!

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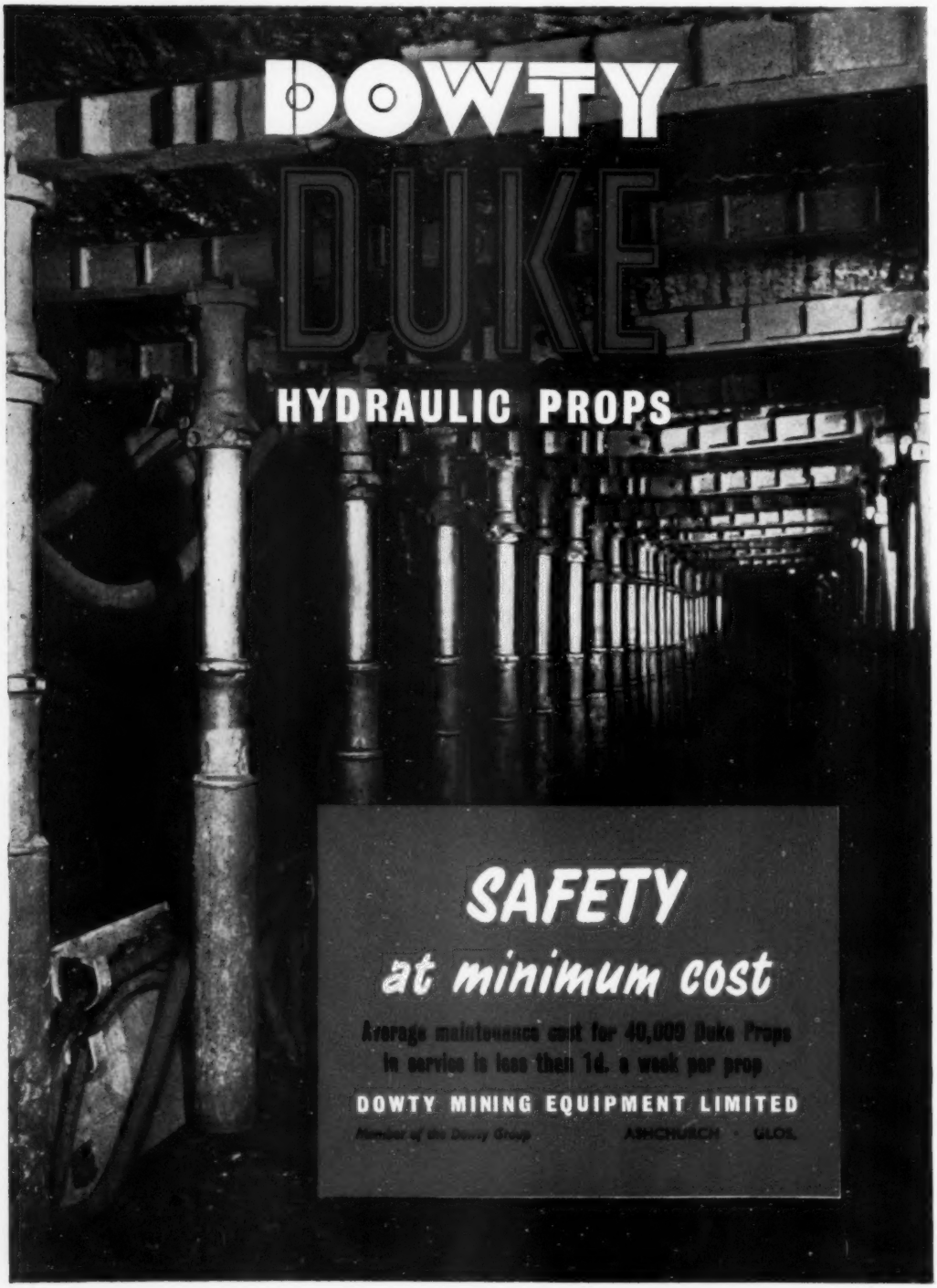
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FOR THE

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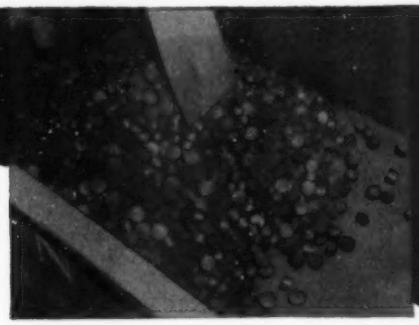
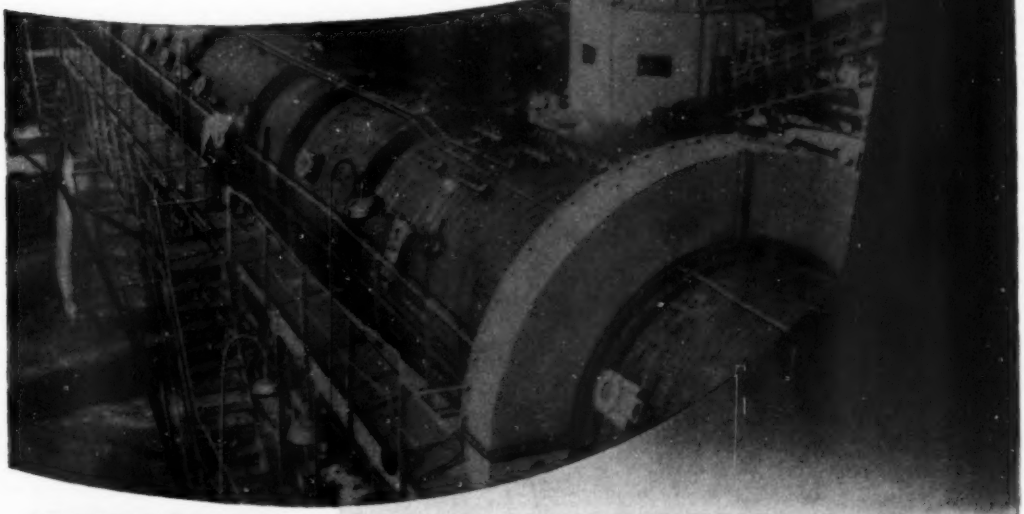


Under a non-exclusive arrangement with the R-N Corporation of New York, Head Wrightson will engineer and supply throughout the world complete plants using the R-N process for the direct reduction of iron ore with subsequent gangue separation and the production of briquettes of a very high iron content.

We invite you to write for full information on this new process. Our engineers are available to discuss the suitability of your own ore to this new method of direct reduction.

REMEMBER

- *The R-N process is not dependent upon the availability of coking coal.*
- *Capital and running costs are competitive with other direct reduction processes, but the R-N process has the technical advantage of subsequently removing the gangue.*
- *The R-N process can use ores and coal that today are not suitable for blast furnace plant.*
- *The R-N product is an excellent feed material for electric arc and open hearth furnaces as well as a convenient cooling material in oxygen converters.*



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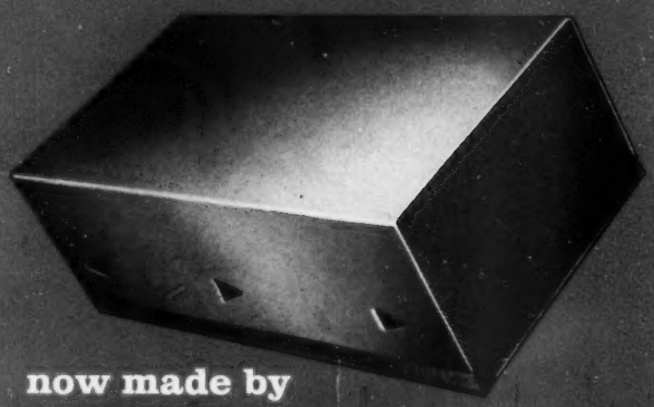
METAL CASED BASIC BRICKS



now made by

Pickford Holland

Under sub-licence from General Refractories Ltd., covered by British Patent No. 546,220 for the basic process of metal-cased brick manufacture and other British Patent No.'s 600,630—749,491—778,047 and 778,048.

METALCLAD "EE" BRICKS

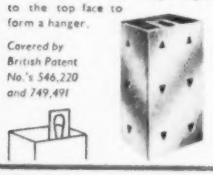
Divided internally by two plates placed lengthwise. This system reduces flaking and spalling to a minimum and can be applied to all Metalclad shapes and sizes.

Covered by British Patent No.'s 546,220, 778,047 and 778,048

TABHANGER SUSPENSION

Bricks supplied with a special stainless steel tab co-moulded with the brick embedded into the surface of the top face. By the use of a special tool the tab may be bent out at right angles to the top face to form a hanger.

Covered by British Patent No.'s 546,220 and 749,491



FERROCLIP SUSPENSION

This method allows the brick to be suspended from the end. The Ferroclip hanger slot may be moulded into any roof or wall shape.

Covered by British Patent No.'s 546,220 and 600,630

P. H. Metalclad bricks are cased in steel on four sides, graded refractory material and metal casing forming an integral unit. That's because of the controlled hydraulic pressure method of manufacture, which allows no air infiltration whatsoever. P.H. Metalclad bricks are easy to install because they're completely consistent in shape and size, and need no jointing cement. Spalling during temperature changes is eliminated, iron-oxide bursting is reduced to a minimum—in other words, they last longer too !

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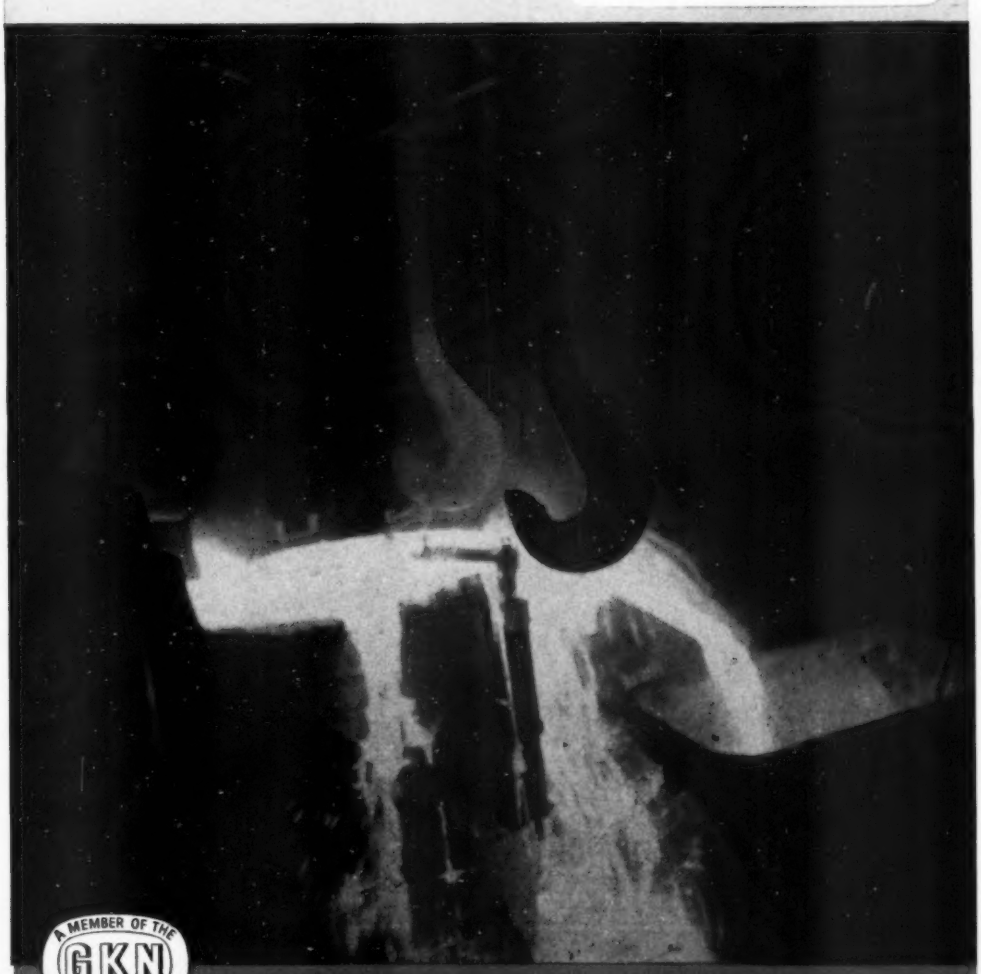

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British Patent Application Nos. 36424/59 · 43573/59 · 35540/57

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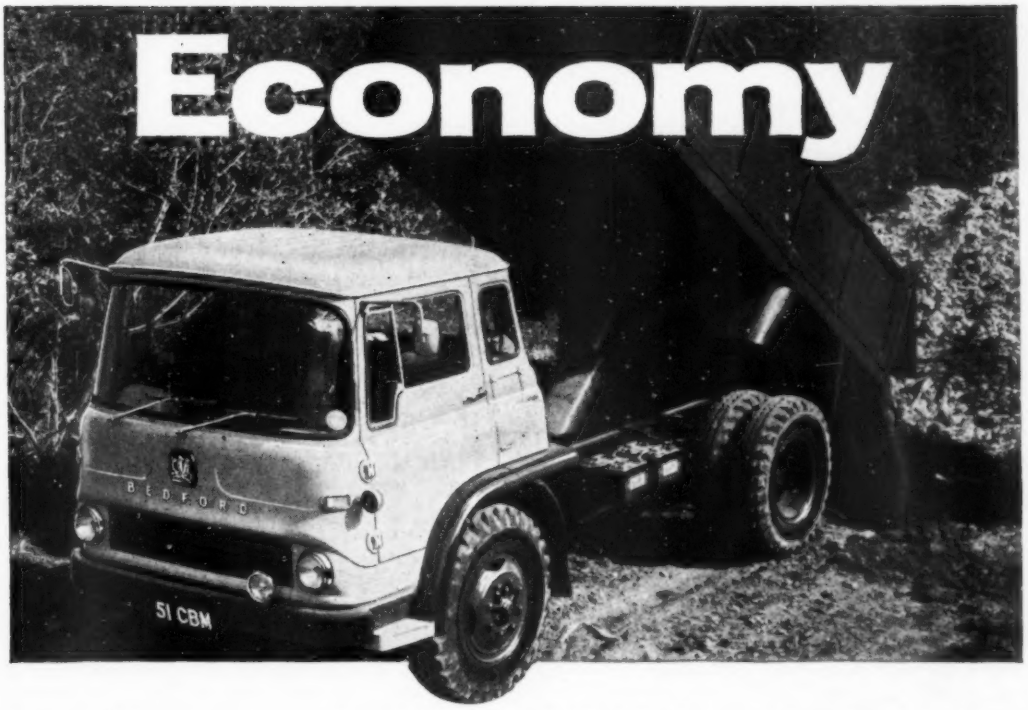

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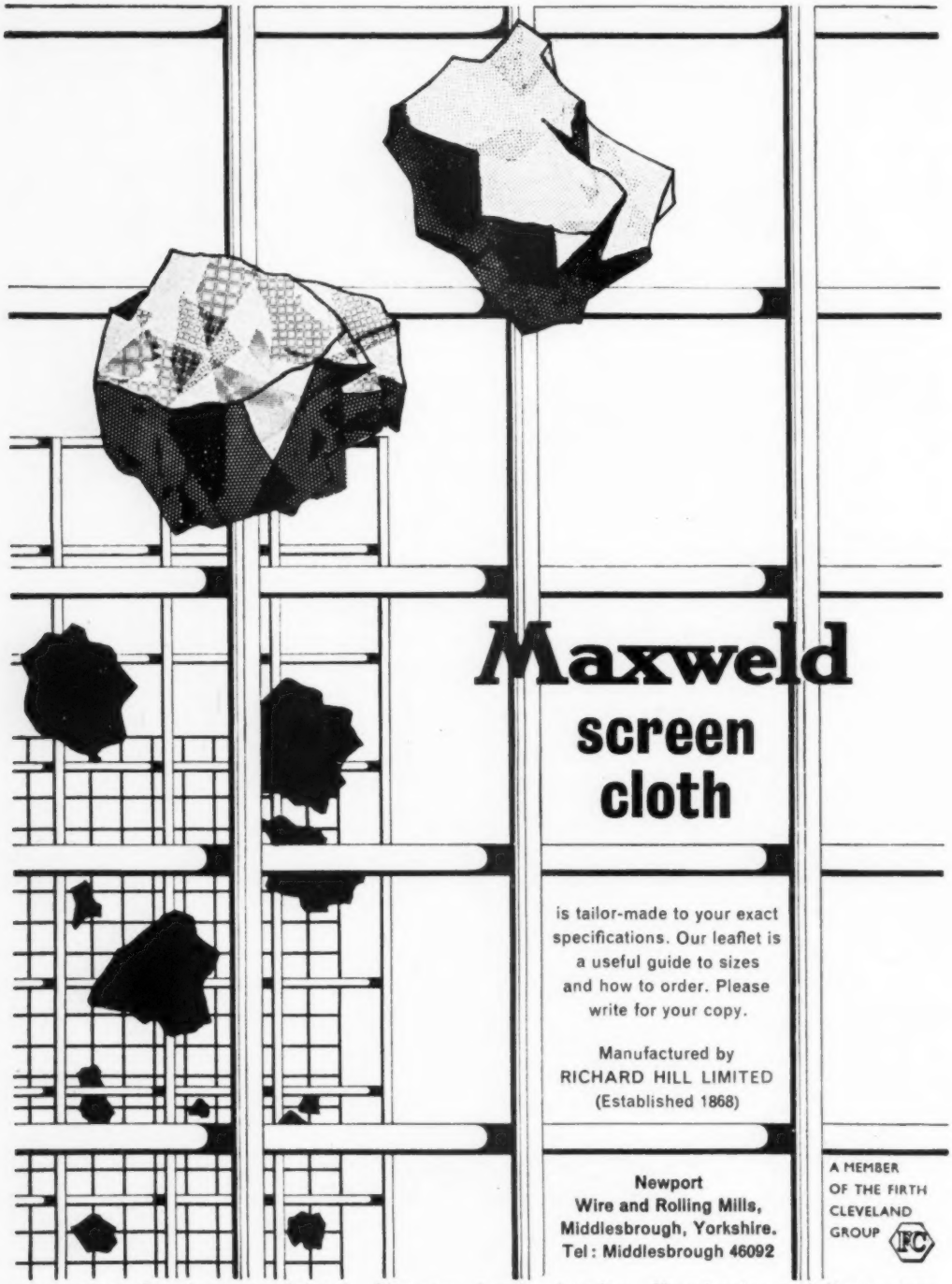
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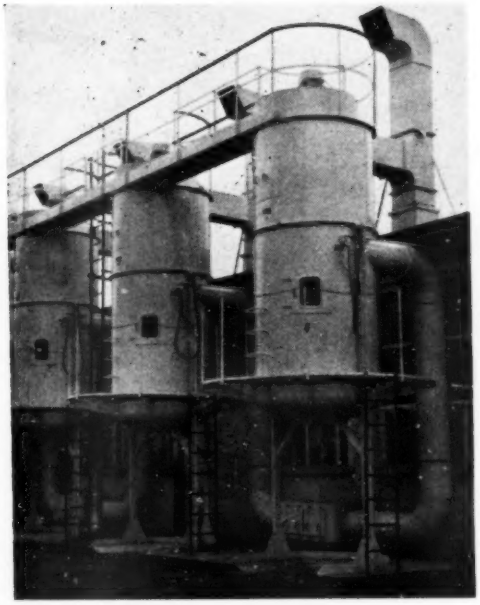

If you have a dust recovery or powder handling problem of any kind, you will find our latest brochure useful and interesting. In it we discuss dust collection in general and give numerous examples of the application of dust recovery equipment to various industries. The information in the brochure is based on many years' experience in dealing with practically every kind of material in powder or fibrous form. It also contains illustrations showing different types of equipment varying from large centralized plant to small individual units Enquiries invited to—
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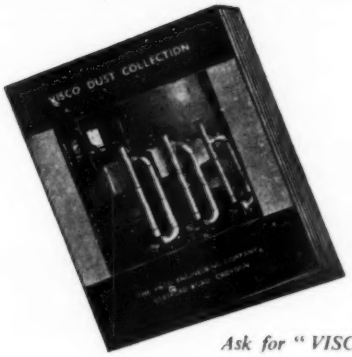

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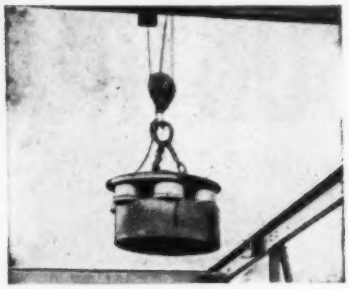
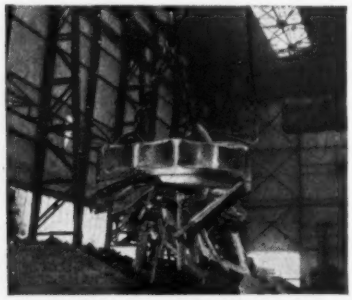
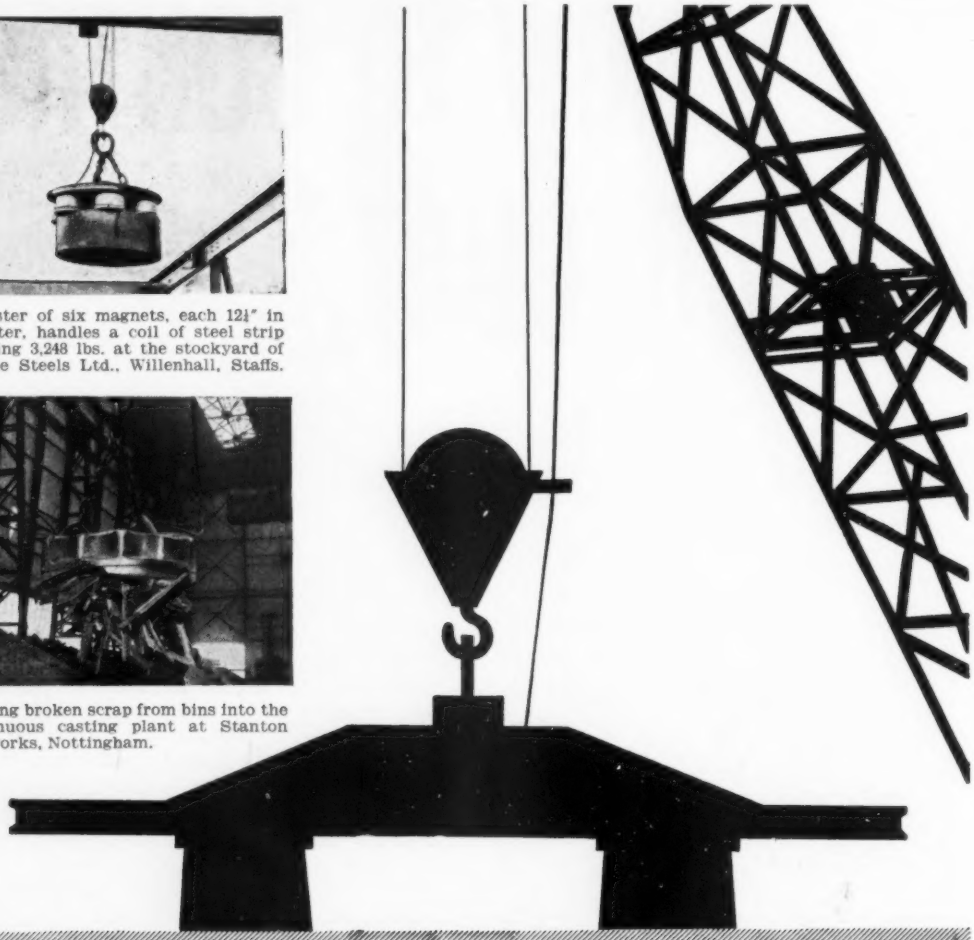


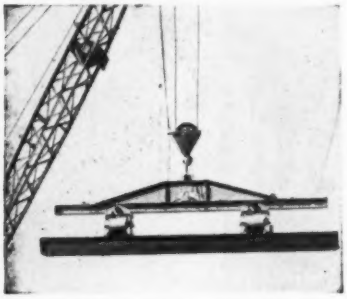
A cluster of six magnets, each 12¼" in diameter, handles a coil of steel strip weighing 3,248 lbs. at the stockyard of Ductile Steels Ltd., Willenhall, Staffs.



Loading broken scrap from bins into the continuous casting plant at Stanton Ironworks, Nottingham.



WITTON-KRAMER LIFTING MAGNETS FOR EVERY JOB



Two bi-polar magnets on spreader beam lifting rolled steel joist.

Whether handling hot steel billets and ingots or salvaging metal from under water, Witton-Kramer electric magnets do the job superbly. Circular, rectangular or bi-polar, G.E.C. makes them all with coils designed and constructed to withstand heavy duty and shock loads. All Witton-Kramer magnets are easily maintained and quickly serviced.

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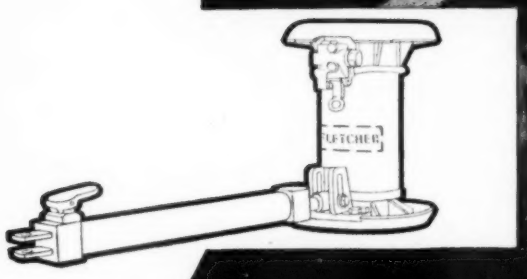
FLETCHER DESFORD CHOCKS

in action



Photograph by courtesy NCB

Following successful installations in the East Midlands Division, the Fletcher Desford hydraulic chock has gained a reputation for reliability.

50 and 100 ton versions: 6″ to 18″ stroke at 2″ intervals.

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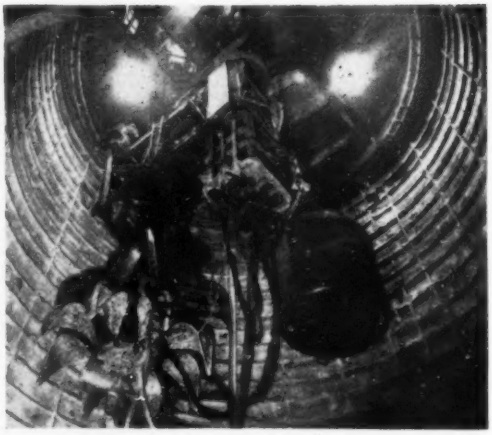

View of the Roadway at Blaengwrach (New Drift), South Wales where, in cross measure coal strata, we established the British Tunnelling Record of 108 yards advance in one week during February, 1961.

(Photographs by courtesy of the National Coal Board)

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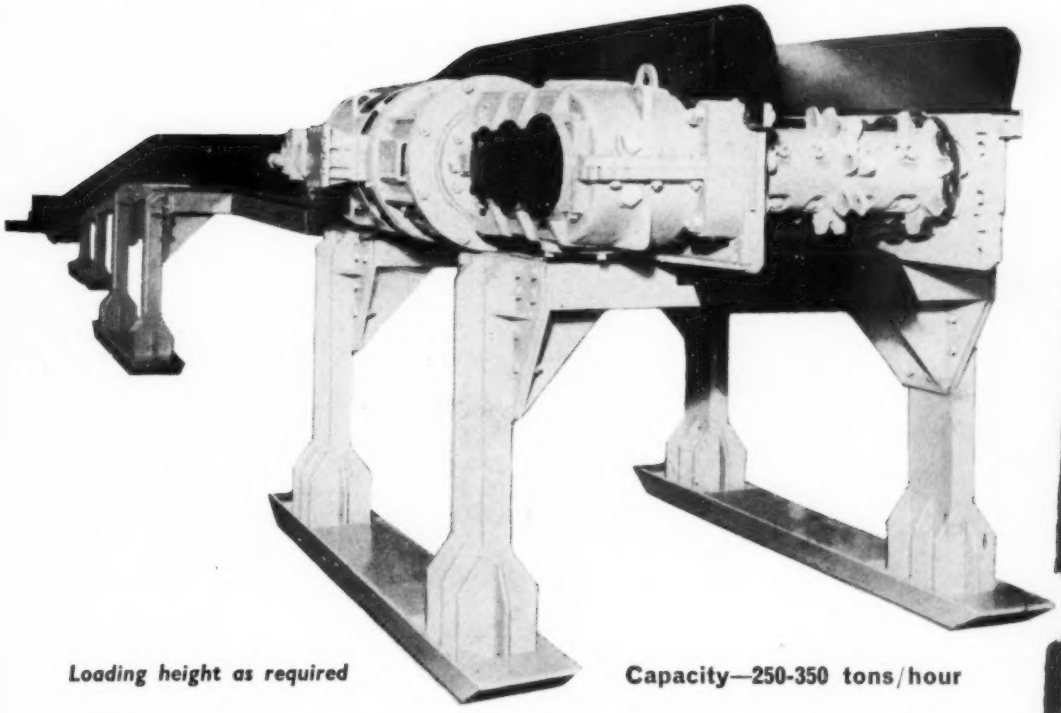

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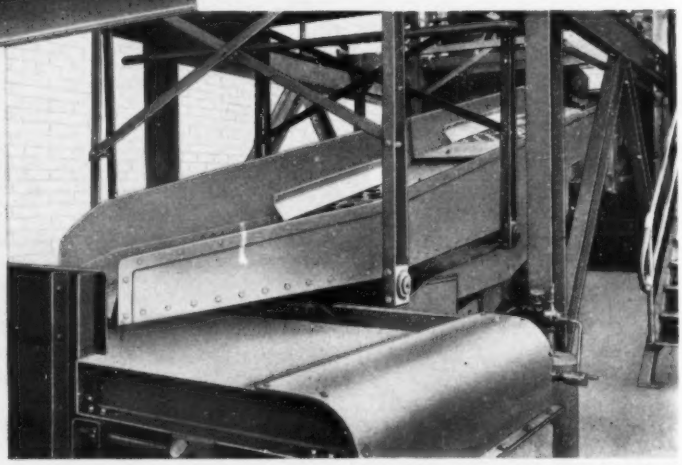

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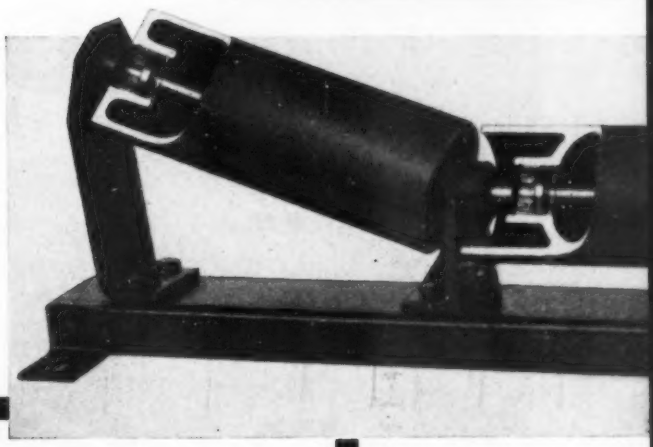

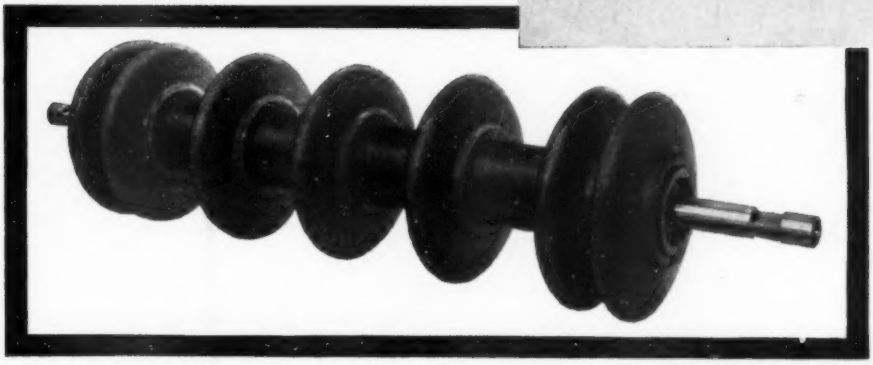

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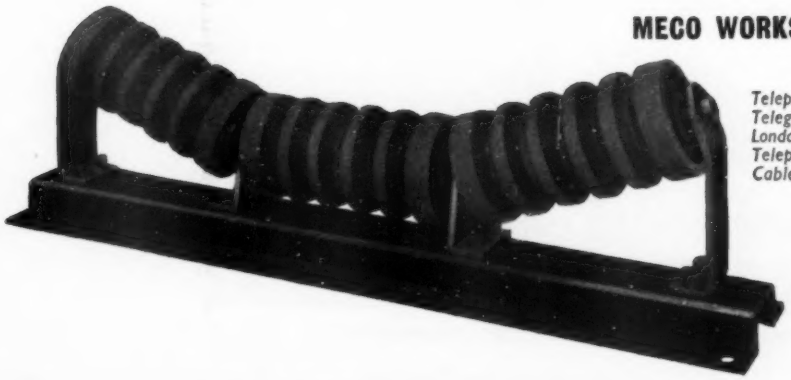

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BH-70 Payloader features for safer, faster bulk materials handling

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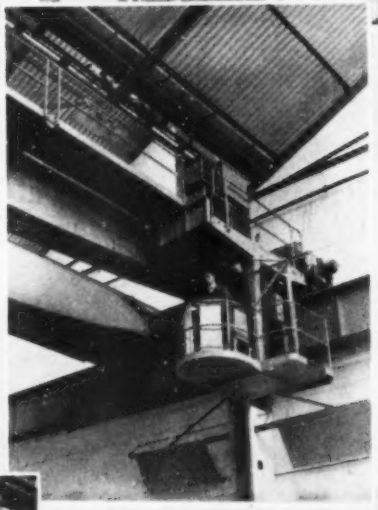

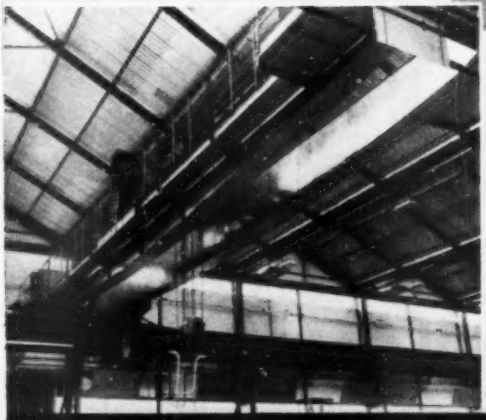

The photographs, by courtesy of Henry Wiggin & Company Ltd., show our latest box plate type girder resulting in low overall weight, high-speed travel and pleasing clean-cut design. The machine has a main hoist capacity of 15 tons, with auxiliary hoist capacity of 5 tons, has a span of 77 feet at a height of 25 feet above floor level.

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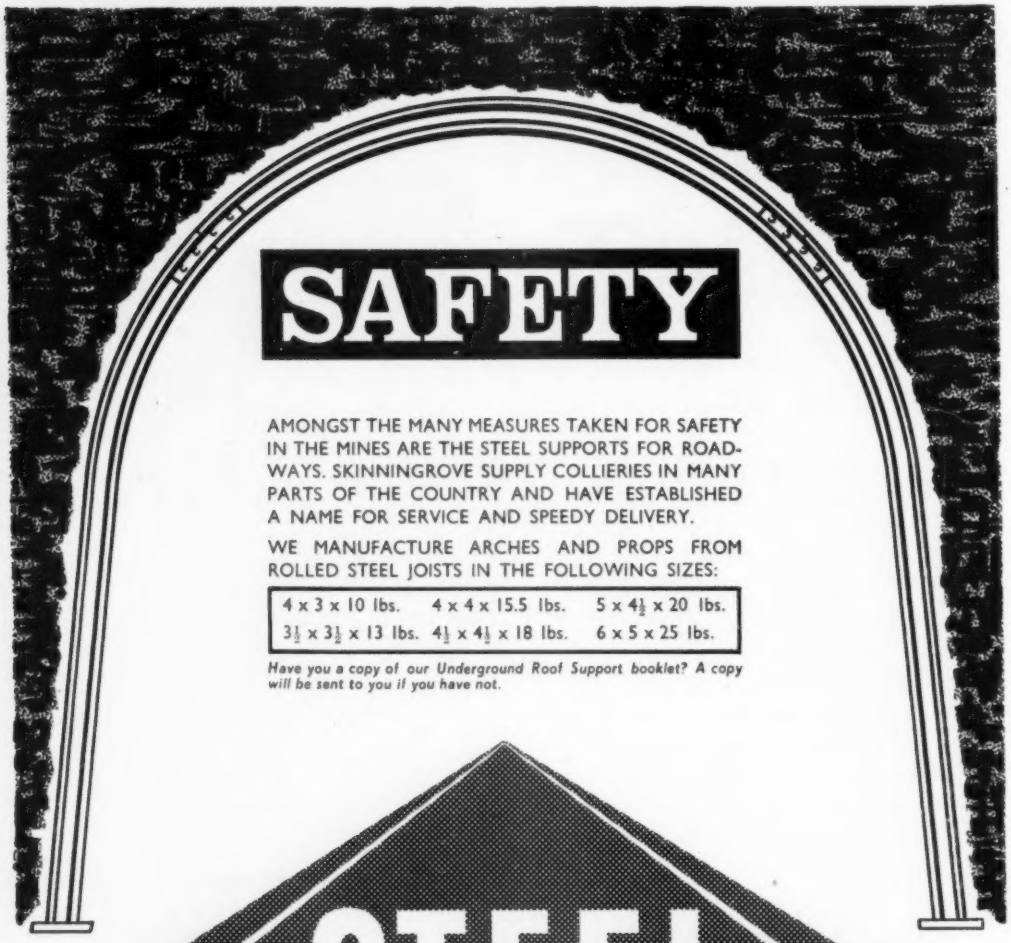

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~~80~~ h.p. to 100 h.p.

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BJD *coalface machines*

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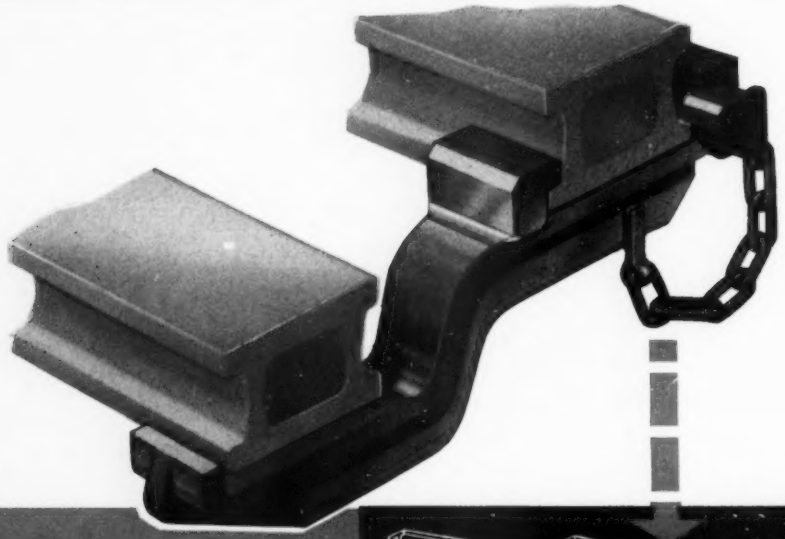

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slide bracket

reduces work and saves time

The Becorit Slide Bracket has been designed for use with stagger-bar systems of support particularly with reference to prop-free front faces. The bracket eliminates the necessity for bars to be lowered to the ground and lifted again and therefore reduces work in support setting and saves time.
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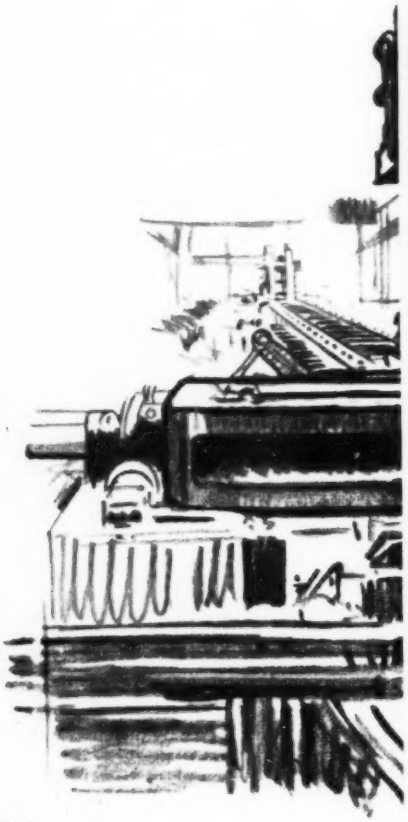


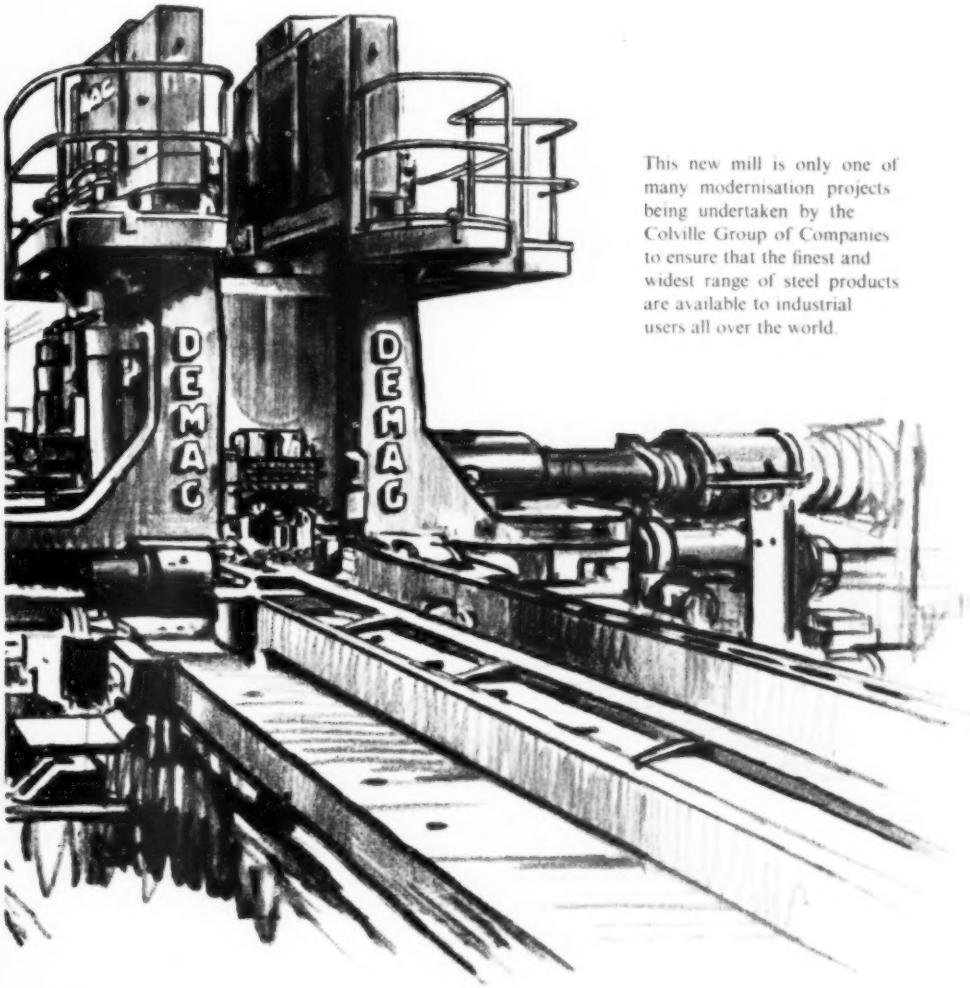
LANARKSHIRE'S UNIVERSAL BEAM MILL IS NOW IN OPERATION

The installation work on Lanarkshire's Universal Beam Mill at Motherwell, Scotland's steel town, is now complete. This Mill will roll Universal Beams with parallel flanges and Universal Columns in accordance with BS 4B 1959.

BEAMS From 8" x 5½" to 24" x 9"
COLUMNS From 6" x 6" to 12" x 12"

Trial rollings are now in progress and very soon Universal Beams and Columns bearing the familiar brand 'The Lanarkshire Steel Co. Ltd.' will be freely available.

ONE OF
THE COLVILLE
GROUP OF
COMPANIES

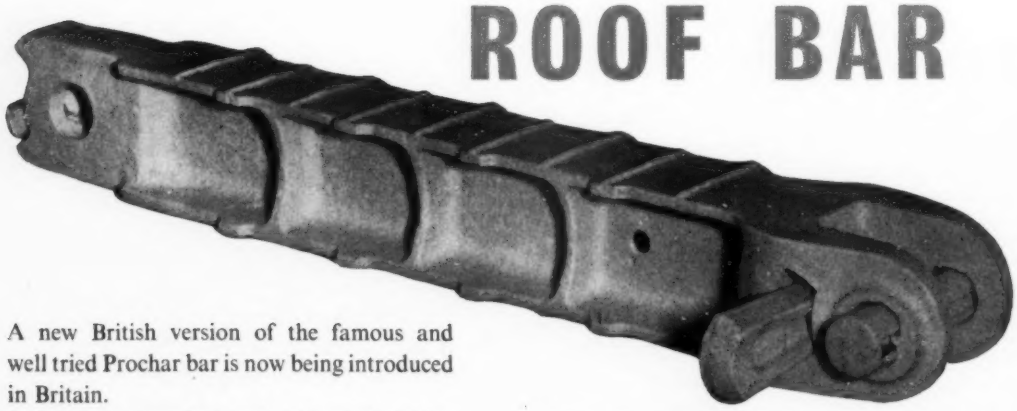


This new mill is only one of many modernisation projects being undertaken by the Colville Group of Companies to ensure that the finest and widest range of steel products are available to industrial users all over the world.

THE LANARKSHIRE STEEL COMPANY LTD.

MOTHERWELL SCOTLAND

Introducing . . **THE NEW PROLLOY ROOF BAR**



A new British version of the famous and well tried Prochar bar is now being introduced in Britain.

It is being manufactured and marketed by LLOYDS (BURTON) LIMITED and is called the NEW Prolloy Roof Bar.

The new bar, fully approved by the National Coal Board, has been subjected to stringent tests on the surface and underground.

Many modifications and new ideas have been incorporated into the new design, all calculated to give better and more economical service where it is needed—underground.

For further details ask for the Prolloy Technical Engineers to call, or ask for the leaflet which gives brief details and specification of the NEW PROLLOY Roof Bar.

N.C.B APPROVAL No B. 17

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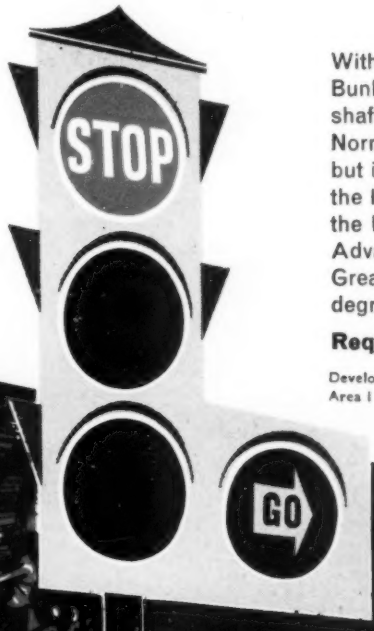
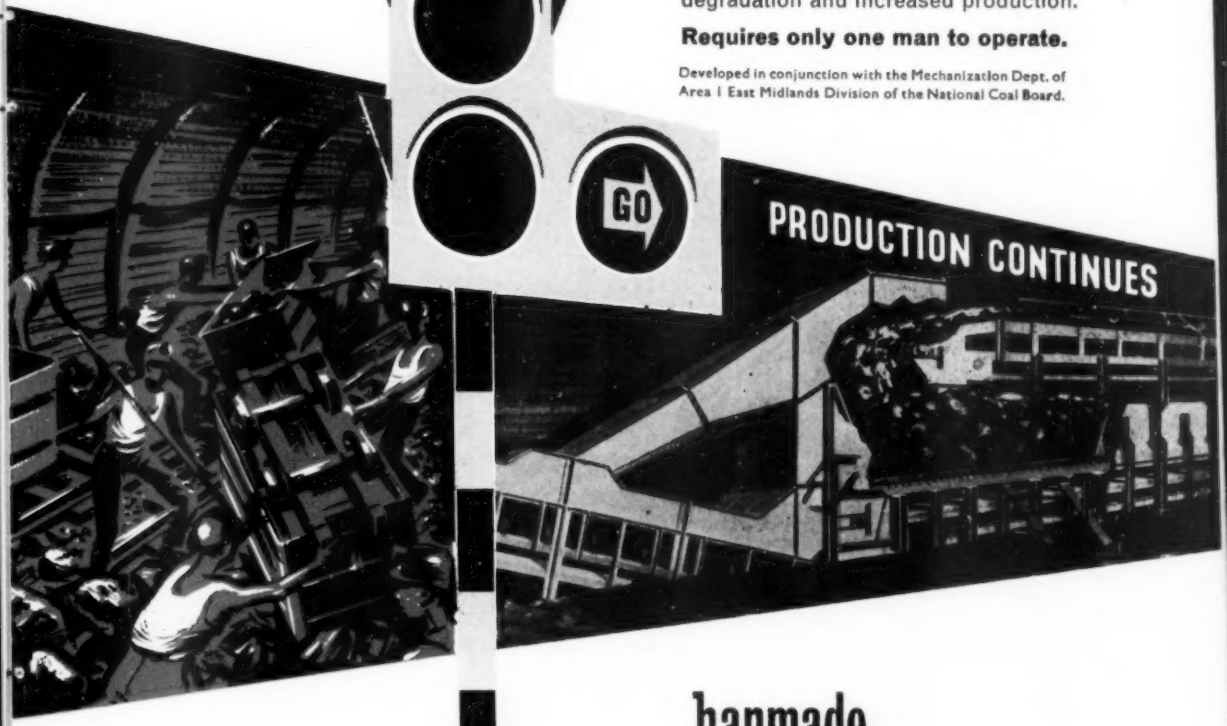


With the Hanmade Anti-breakage Storage Bunker haulage breakdowns, derailment or shaft hold-ups need not stop production. Normally coal can proceed "straight through" but in the case of bottle necks out-bye of the bunker, production can be turned into the Bunker and unloaded later in the shift.
Advantages?
Greater flexibility of output, less coal degradation and increased production.

Requires only one man to operate.

Developed in conjunction with the Mechanization Dept. of Area 1 East Midlands Division of the National Coal Board.

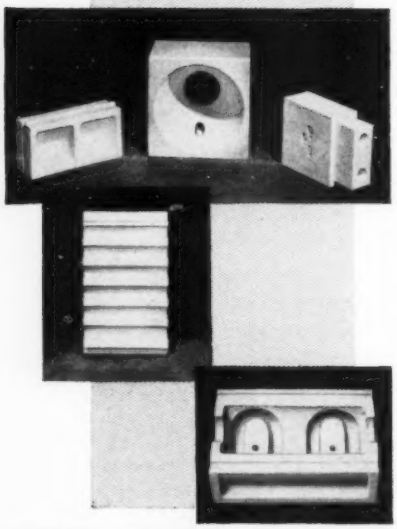


hanmade anti-breakage storage bunker

HANMADE CONVEYOR CO. LTD., WINIFRED STREET, HUCKNALL NOTTS. Telephone 3448/9

'MULLOX' BRAND Sillimanite Bricks

For Volume Stability at Extreme Temperatures



The ability of 'Mullox' bricks to show little or no volume change at extreme temperatures, plus an excellent spalling resistance, makes them ideally suited for all structures subjected to mechanical stress or thermal shock at high temperatures, e.g. burner blocks, combustion chamber linings, etc. Again, being chemically 'neutral' also, they withstand the corrosive action of most slags, and are not affected by oxidising or reducing atmospheres.

Examples of Recommended Applications

FURNACE CONSTRUCTION

In the Ferrous, Non-Ferrous, Glass, Porcelain, Vitreous Enamel and Ceramic Industries, i.e. Melting, Reheating, Heat Treatment, Normalising, Muffle Furnaces and Kilns:—

(a) Combustion Chambers and Fireboxes.
(b) Burner Blocks.
(c) Gas Port Blocks.
(d) Burner Baffles.
(e) Hearth Tiles.
(f) Sidewalls.
(g) Roofs.
(h) Hot Repair Tiles.

ROTARY KILNS

(a) High Temperature Linings.
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In this Issue—

DEVELOPMENT AND PROVING
Work of the Central Engineering Establishment - page 395

BWRA'S NEW ENGINEERING LABORATORY
Two-storey Building at Abington Hall - - - page 405

VALVES OF HOT-BLAST STOVES
Measures to Prevent Leakages - - - - page 409

ACCIDENTS AT MINES
HM Chief Inspector's Report for 1960 - - - page 413

ELECTRIC FURNACE MELTING SHOP
New Method of Handling Lime - - - - page 417

	PAGE
Leading Article: Tinplate	385
Dorman Long (Steel) Development Programme	386
Orders Placed	386
Polish Coal Imports	387
Passing Thoughts	388
Indian Coal Loan	389
Personal	390
New General Manager for Swansea Area, NCB	390
"Rational" Policy for Coal	391
Holman Chief Urges Need for Exports Aid	392
Continued Rise in India's Mineral Output	392
Large US Tinplate Order Secured by SCOW	392
British Group May Build Yugoslav Steel Plant	392
Obituary	393
Appointments	394
Chancellor's Economic Planning Proposals	394
International Coal Preparation Congress	404
Future of Ironmaking	408
British Standard for Forks, Shovels, and Spades	408
British Iron and Steel Industry Translation Service	410
New Patents	412
Soviet Production During First Half-year	418
Finsider Group Output	418
Swedish Market for Iron and Steel	419
BEAMA Golden Jubilee Export Conference	420
Furnace Line Converted Without Production Loss	420
Cargo Fleet's New Iron-ore Unloader	421
"Hydrogen in Steel" Conference	423
International Conference on "Creep and Fracture"	423
Automatic Mechanical Car Parking	424
Fewer Mining Students at Birmingham	424
New Literature	425
New Steel Creep-testing Laboratory	426
Rationalizing Structural Steel Production	426
Japanese Steel Mission in Australia	426
French Coal Cutback	427
Inroads into Coal Stocks	427
Coal Chartering	427
Board Changes	428
Mr. N. C. Lake Becomes BIM Regional Chief	428
Iron and Steel Trade	429
Ore Chartering	429
Fall in Orders Continues at Appleby-Frodingham	430
French Steel Company's Progress	430
GEC Exhibition	430
Coal for Gas	431
Fall in Labour Force in Welsh Pits	431
Coalfield News	432
The Coal Trade	433
Coal Chartering	433
British Blast Furnaces in the June Quarter, 1961	434
The Scrap Markets	434
More Cuts in Iron and Steel Production	435
Company News	436
News in Brief	438
Higher Current Profits by Amalgamated Anthracite	438

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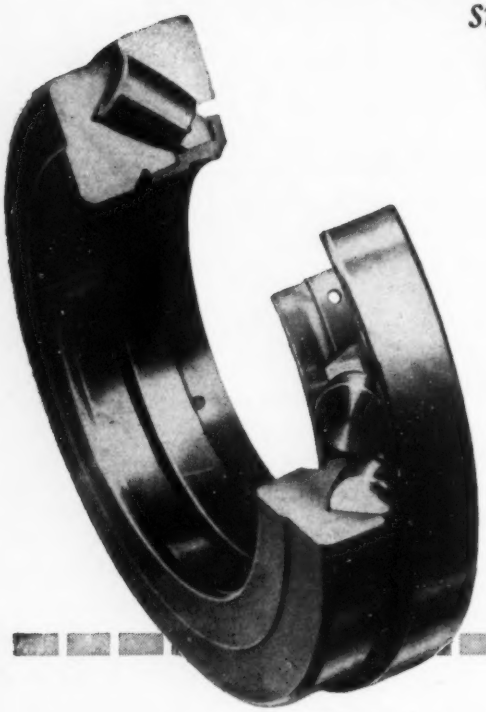

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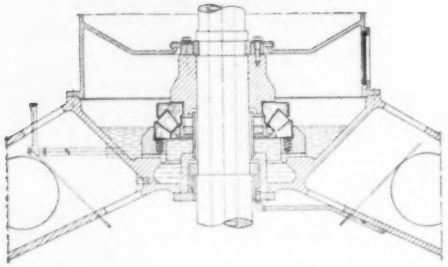

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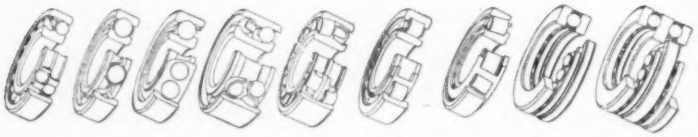

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IRON & COAL
THE IRON AND COAL TRADES REVIEW

Vol. 183 August 25, 1961 No. 4,858

Mine Accidents

IN his report for 1960, HM Chief Inspector of Mines records that in the 12 months 317 men were killed and 1,573 seriously injured, compared with 348 killed and 1,676 seriously injured in 1959. The 1960 figures include 45 men killed at Six Bells Colliery, Monmouthshire, and those for 1959 include 47 men killed at Auchengeich Colliery, Lanarkshire. Because each of the two years, regrettably, witnessed a major incident, the total figures are comparable, and they show a gratifying reduction of 31 persons killed and 103 seriously injured. It has to be remembered, however, that the manshifts worked in coal mines in 1960 were appreciably fewer than in 1959, and taking this into account, there has been no improvement at all in the rate for persons killed, and an actual deterioration in the rate for persons seriously injured.

The Chief Inspector, Mr. T. A. Rogers, is understandably perturbed. The fact that there has been little or no improvement over the past 10 years must, he suggests, "surely act as a spur to managements and workpeople alike to attack afresh the problem of accident prevention in mining." Disappointment at the progress made led the National Association of Colliery Managers to devote its 1961 conference to an examination of safety matters. In the opinion of HM Inspectors, at least half of the accidents occurring every year could be avoided by compliance with the law or the exercise of ordinary care. Mining engineers will not quarrel with Mr. Rogers's statement that "it is mainly by better standards of human behaviour that any substantial improvement can be achieved."

The Chief Inspector makes special mention of surface accidents, in which 30 persons were killed in 1960 compared with 22 in 1959, and 187 persons were seriously injured compared with 174. Over the last 15 years, there has been barely any improvement in the rate of persons killed in surface accidents, while the rate of persons seriously injured has increased. This puzzles colliery managements just as much as it does the Chief Inspector, and is an aspect of the accident figures to which attention was called at the NACM conference. It is reasonable to think that the improvement in surface layouts at many collieries should have led to a substantial fall in the accident rate.

The number of persons killed by falls of ground, 124, was the lowest ever recorded, and the number of seriously injured persons, 639, was considerably lower than for 1959. Accidents appear to be less frequent in places where conditions are normal, but still seem to occur with the same frequency where there is a greater measure of hazard—for instance, where supports are being disturbed. The numbers of persons killed or seriously injured in accidents with explosives (six and 25 respectively) are exactly the same as for 1959. The Chief Inspector of Mines considers the figures disappointing in view of the fact that both manpower and output declined during the year. Most accidents continued to be caused by contraventions of the law and were the result either of the injured man taking inadequate shelter or of the shotfirer failing to determine correctly the extent of the danger zone.

The number of fires in coal mines is still increasing—76 in 1960 compared with 71 in 1959. Because every fire has the potential of developing into a major disaster, this trend is a matter of grave concern. The Chief Inspector considers that better standards of installation, maintenance, and cleanliness of apparatus and machinery would do much to reduce the number of fires.

Mr. Rogers regrets that the amount of water infusion of coal—often, he says, the most effective dust suppression measure because it wets the coal before it is worked—has declined in favour of other dust prevention methods which aim at suppressing the dust after it has become airborne. He recommends that more attention be given to deep hole water infusion with the aim of infusing, in one operation, sufficient coal for a week's face advance.

The Chief Inspector considers that standards of illumination below ground could be considerably improved merely by cleaning the glass on lighting fittings and by whitening the roof and sides of working places. He is of the opinion that if more attention were paid to these matters and to the careful siting of fixed lights, the resulting improvement in lighting standards would bring about a reduction in the number of accidents, particularly those connected with haulage and transport.

AS PART of a safety campaign at Overtown Colliery, near Wishaw (Lanarkshire), a pit with a high accident rate, an exhibition has been opened at the colliery. The 600 miners and officials have also received a personal letter from the pit safety committee asking for a concerted effort to help reduce the accident rate.

DATE FOR THE closing of the Sunniside Drift of Roddymoor Colliery, Crook (Co. Durham), has been brought forward to September 15. The original intention was to close the drift in two stages, in September and later in the year. Decision to transfer 80 men to the Brancepeth Colliery, Willington, will now affect only 61 miners as 19 will stay at the drift to do salvage work.

Dorman Long (Steel) Development Programme

FIRST major orders in connection with the present stage of the Dorman Long (Steel), Limited, development programme have now been placed. Davy & United Engineering Company, Limited, Sheffield, has secured the order for a 48 in. by 130 in. high-lift slabbing and blooming mill at Lackenby, at a price of £1,300,000.

Intended to roll 25,000 tons of ingots per week, to produce blooms and slabs, the mill will be sited alongside Dorman Long's existing universal beam mill at Lackenby. The slabs produced will supply the existing wide plate mill at the company's Redcar Works, and the blooms necessary to meet the increasing requirements of the company's medium and light finishing mills. The mill will also supply in due course a new universal 4-high plate mill capable of producing 60-in. wide plates with rolled edges.

The soaking pits, valued at approximately £700,000, will be supplied by Priest Furnaces, Limited, Middlesbrough.

The order valued at approximately £450,000 for the blooming and slabbing mill electric drive, has been placed with Associated Electrical Industries, Limited. This new drive consists of two 5,000 h.p. motors driving top and bottom mill rolls independently. The motors are supplied from grid controlled reversing rectifiers. Orders will shortly be placed for the mill auxiliary motors, control gear, switchgear and electrical distribution equipment.

The Wellman Smith Owen Engineering Corporation, Limited, will supply ingot stripping and soaking pit cranes to the value of about £400,000.

All the foundation work for the mill will be carried out by the bridge department of Dorman Long, who did the foundations of the Lackenby steel plant and universal beam mill. The mill buildings will be supplied and erected by Dorman Long (Bridge & Engineering), Limited, Redpath, Brown & Company, Limited, and the Tees Side Bridge & Engineering Works, Limited.

Action Needed to Keep Down US Steel Prices

ACTION to prevent a rise in steel prices in the autumn was demanded in Washington on Tuesday by Senator Albert Gore (Democrat). He said he saw indications that a $5-a-ton increase would accompany the rise in steelworkers' wages scheduled for October unless something were done to prevent it. An increase in steel prices was likely to lead to a new round of inflation.

"It may well be that the large steel companies can and should be broken up into smaller units so that true competition may be restored," Senator Gore said. If all else failed, steel prices could be brought under regulations, but before such measures were taken President Kennedy should try moral persuasion.

Actual production of raw steel in the US during the week ended August 21 totalled 1,944,000 tons. This was a 1.8 per cent. increase, compared with the 1,910,000 tons produced in the preceding week. Actual raw steel production in the US in the current year to date at 58,090,000 tons is a 17.9 per cent. decrease, compared with the 70,755,000 tons produced in the corresponding period last year.

Orders Placed

AEI Computer for Scottish NCB

FULLY integrated data processing system, worth £250,000, has been ordered by the Scottish Divisional Coal Board from Associated Electrical Industries, Limited. The system, which incorporates AEI's 1010 digital computer, will handle wages and salary data of 90,000 people in 132 collieries, 22 brickworks, and other establishments.

The 1010 will also undertake materials and supplies accounting involving costing and processing of 14,600 stores items a day and will record the despatch of 4,500 loads of some 1,200 different qualities of coal a day. As a by-product of its normal programme, the system will provide automatically any statistics for marketing, finance control, and other purposes. The equipment will be installed by the end of 1962.

FOSTER WHEELER, LIMITED, has placed an order, worth nearly £3,000, for stainless steel sieve trays to be used in the refining of crude oil with Andrews Bros. (Bristol), Limited, Liverpool, through its London agent, K. A. Ballard, Limited.

ALL HEAT EXCHANGER mountings and steam and feed pipeline valves required at the 580 mW power station at Sizewell (Suffolk), are to be supplied by Dewrance & Company, Limited, London, S.E.1. The value of the contract is £167,000.

CONTRACT worth £45,000 has been placed with Hale Construction Company, Limited, for a new heavy fabrication shop and dust research laboratory for Keith Blackman, Limited, manufacturers of fans and gas heating apparatus, etc., of London, N.17.

MANUFACTURERS OF MECHANICAL TOOLS, of Leeds (Yorks), Midgley & Sutcliffe, Limited, has received one of its largest orders for milling and drilling machines from Norman N. Benson & Company, Limited, machine tool distributors, of New South Wales.

ORDERS FOR newspaper conveyors, known as "Igranics," have been received by Brookhirst Igranic, Limited, a company in the Metal Industries, Limited, group, from Niewe Rotterdamse Courant, of Rotterdam, Dagens Nyheter, of Stockholm, and Paris Soir. Conveyors are also in hand for the Daily Mirror, Daily Express, Evening Standard, the Thomson organization, and Sun Printers. Value of all the orders is put at £85,000.

Krupps to Build Steel Plant for Brazil

NEGOTIATIONS with the German Krupps group are expected to be concluded next month for the erection of a $250,000,000 steel plant with a capacity of 500,000 tons a year near Rio de Janeiro, Brazil, according to a statement by the Governor of the State of Guanabara. Krupps are reported to be considering a substantial capital subscription in the project, in participation with Brazilian official and private capital.

It is expected that about half of the shares in the new plant will be held by the State of Guanabara (the former federal district of Rio de Janeiro), though it is expected that there may also be national participation, following a recent visit of one of the Krupp directors to the President of Brazil.

Polish Coal Imports

SOUGHT BY TUNNEL CEMENT TO CUT FUEL COSTS

GOVERNMENT permission to import Polish coal is being sought by the Tunnel Portland Cement Company, Limited, in an effort to reduce its fuel costs and improve its competitive position in export markets. Mr. N. M. Jensen, chairman and managing director, states that approaches to the National Coal Board for suitable supplies have met with a "far from satisfactory" response. "Not only is the quality we require not available; the prices have again risen substantially. Yet at the same time suitable British coals are sold to some of our competitors on the Continent at prices approximately two thirds of those we are being asked to pay."

The application for the licence is now being considered by officials at the Ministry of Power and the Board of Trade—the two departments chiefly concerned in the recent rejection of the request by Steel Company of Wales, Limited, to be allowed to import US coking coal.

The move by Tunnel Cement stems from the Government's tax on fuel oils in April, and the lifting of the level of this tax still higher in last month's economic measures. The cement industry generally has been critical of these measures. Even before April cement export prices were generally below those operating in the UK.

Hit by Fuel Oil Tax

In his annual report, Mr. Jensen says that the April and July Budget measures added 44s. a ton to fuel oil costs. Two or three years ago, he recalls, it was decided to switch over to fuel oil, and although the group was paying 16s. to 27s. more per ton than some Continental competitors "we were reasonably happy." The imposition of the 44s. fuel tax meant that the company's fuel oil costs were now 60s. to 71s. a ton more than those of some Continental competitors.

Mr. Jensen goes on: "As the export market in cement has always been highly competitive, the answer to the Government's request for us to export more and more of our products is that it just cannot be done, except by heavy sacrifices or by the home production subsidizing export."

Mr. Jensen says that when the company recently endeavoured to find out whether the National Coal Board could supply suitable coal for some of the inland works, the board's response was "far from satisfactory." In all the circumstances "we have decided to apply for permission to import coal from Poland. This is available in sufficient quantities, at a consistent quality and at lower prices."

"When the full impact of the fuel oil tax has been felt," Mr. Jensen adds, "I hope that the Government will have realized that it is no use imploring British industries to export more and more unless such industries are able to obtain their fuel and power requirements at competitive prices."

Commenting on Mr. Jensen's statement, a National Coal Board spokesman said on Tuesday that the company had asked the board to tender for coal supplies to one of its works near Tring (Herts)—a plant which took about 75,000 tons a year from the Nottingham area before it went over to oil.

"When we were asked to become suppliers again after the April Budget, the special qualities we used to send them were no longer available," the spokesman said. "They had been snapped up by other customers; but we did make an effort to supply them with satisfactory alternatives.

"Tunnel used to take about 250,000 tons a year from us for another works at West Thurrock (Essex), before this was converted to oil. We could most probably supply the same grades as before to this plant if we were asked."

Regarding exports, the coal board has been selling coal on the Continent for some time at below UK prices, simply to maintain a footing in traditional markets. It has frequently complained that Poland has been undercutting West European suppliers, and has been delivering substantial tonnages at prices which cannot possibly reflect true production costs.

President of the National Union of Mineworkers, Mr. S. W. G. Ford, commented on Wednesday that the union had already made strong protests to the Government against any suggested imports of foreign coal. Within recent months, it had expressed its deep concern over the actions of certain countries, particularly Poland, in trying to encroach on the British home fuel market, and in underselling British coal in foreign markets by means of subsidies or dumping at prices well below the actual costs of production.

As had been pointed out in dealing with previous applications for licences to import foreign coal, it would be impossible to restrict the granting of licences to a single company, and any widespread imports of cheap Polish coal would inevitably threaten the stability of the British coal industry and seriously jeopardize the living standard of British mineworkers.

"It has to be borne in mind," Mr. Ford went on, "that the British coal mining industry provides some 200,000,000 tons of coal a year to British industry and domestic consumers. Any action such as that now proposed by the chairman of Tunnel Portland Cement Company would inevitably lead to a situation in which the British coal mining industry—unable to compete against such Polish coal as could be made available in the British market—would be forced to reduce its production potential, thus further increasing the cost of producing British coal."

The consequent increase in the price of British coal, said Mr. Ford, would in turn seriously handicap the competitive position of that section of British industry which could not obtain Polish coal, because of the limited supplies available. Any benefit which Tunnel Cement would expect to obtain from importing Polish coal could in the end, therefore, only be gained at the expense of other sections of British industry, and with grave social consequences for the British mining communities.

Passing Thoughts . . .

OFFICE employees will daily sweep the floors, dust the furniture, shelves, and showcases. . . . Each clerk will bring in a bucket of water and a scuttle of coal for the day's business. . . . Men employees will be given an evening off each week for courting purposes or two evenings a week if they go regularly to church. . . . After an employee has spent his 13 hours of labour in the office he should spend the remaining time reading the Bible and other good books. . . . Any employee who smokes Spanish cigars, uses liquor in any form, or frequents pool and public halls, or gets shaved in a barber shop, will give me good reason to suspect his worth, intentions, integrity, and honesty.—From a set of office rules issued in 1872 by the owner of a carriage works in the US, and reproduced in the current issue of Thorncliffe News, the journal of Newton, Chambers & Company, Limited.

Britain and the United States put a limitation on exports of their manufacturers (sic) *to Russia. What did they achieve by it? Only the Sputnik and astronauts!—Daily Express.*

There are still firms who do not realize the value of allowing employees to take courses during the daytime. While there is now a more realistic approach by industry to the education and training of personnel, there is still a tendency to think of it as something which has to be completed by a certain age.—MR. D. A. R. CLARK, principal of Nottingham and District Technical College.

If there is one thing that annoys the customer more than receiving the material after the date of promised delivery, it is to have it dumped on his doorstep weeks before he is expecting it.—MR. G. D. ELLIOT, *chairman of Appleby-Frodingham Steel Company, branch of the United Steel Companies, Limited.*

At the same time that the Government is exhorting British producers to export it introduces measures which are bound to make it infinitely more difficult for steelmakers to do so. This is surely an exercise in elementary arithmetic, not economics. At least it looks that way to steelworkers in the dole queue, and the coal industry would do well to remember that unemployed steelworkers have never lacked the company of unemployed miners in such circumstances.—MR. HARRY DOUGLASS, general secretary of the Iron and Steel Trades Confederation, writing in its journal Man and Metal.

We must remember when talking of going into the Common Market that those already in it will come here and it is going to be a hard fight.—MR. W. J. RUSTON, *chairman of Ruston & Hornsby, Limited, engineers, steel and iron founders, etc., of Lincoln.*

Soon our products and services will have to measure up to the best than can be offered by the great industrial nations of Europe. We have heard a great deal about the winds of change. Most people think they blow only in places like Africa and South America, but in two or three years' time they will be at gale strength here in this country.—SIR MILES THOMAS, chairman of Monsanto Chemicals, Limited.

Coal is about the only commodity in Australia that is cheaper today than it was five years ago—and the quality is better.—SIR EDWARD WARREN, *chief executive and director of Coal and Allied Industries, Limited, of Australia.*

In his crusade to see that coal sells, it is impossible not to be infected by the enthusiasm of Lord Robens, chairman of the National Coal Board. . . . It does seem that this nationalized industry will soon be emerging from the "red," and that will be nothing more than a just reward for the energy and drive which at present marks the industry. It will be a feather in the caps of miners everywhere.—Sheffield Telegraph.

What I want is dear miners and cheap coal. I don't want cheap coal at the expense of cheap miners, and the only way I can get cheap coal is by an intensification of mechanization.—MR. W. H. SALES, *chairman of the North-Eastern Divisional Coal Board.*

Nobody is better aware of the state of the coal industry as a whole than Lord Robens, and consequently it must be assumed that he has good grounds for his optimism. And so indeed he has, up to a point. The productive power of the industry is very great; it is only a question of employing it to its maximum capacity.—The Guardian Journal, Nottingham.

If the rating system is to continue to work and be accepted by industry and householders alike, it is essential now to iron out the anomalies that have persisted for years—and prevent unnecessary ones creeping in by the operation of the revaluation process.—The Economist.

Bromford Iron & Steel Executive's Appointment

MR. ROBERT MILLS, commercial director of the Bromford Iron & Steel Company, Limited, West Bromwich (Staffs), has been appointed to serve on the executive committee of the North American Export section of the Birmingham Chamber of Commerce. Mr. Mills, who has travelled extensively for the companies with which he has been associated, plans to visit Europe, Australia, New Zealand, and India later this year.

He was for 14 years with Charles Wade & Company, Limited, iron and steel stockholders, of Birmingham, before joining the Whitehead Iron & Steel Company, Limited, group which he served as commercial manager and Midlands area manager. He joined Bromford Iron & Steel last year.

Mr. Mills has, over the last few years, been connected with the Reinforced Concrete Association as its Midlands chairman, and he has also been on the association's London Council and finance committees.

UK MANUFACTURING PRICES UP IN JULY

PRICE index of total sales of manufacturing industry in the UK rose 0.2 per cent. between June and July, states the Board of Trade. The index, which includes finished goods of all kinds and exports of semi-manufactured goods as well as finished products, has risen 15.6 per cent. since 1954. The rate of rise in the first half of this year was at an annual rate of 2 per cent.—the same as in 1960. Part of the increase in prices is accounted for by higher rates of duty.

The July index of prices of basic materials and fuel used in manufacturing industry is down 0.2 per cent., and at 96.4 (1954=100), is the lowest for nearly three years.

Indian Coal Loan

£13,000,000 FOR PRIVATE MINES EXPANSION

TO assist the private coal mining industry in India to expand production, a loan equivalent to $35,000,000 (nearly £13,000,000) to the country has been approved by the World Bank. To meet the industrial goals of the third Five-Year Plan, India's annual production of coal will need to be increased by some 80 per cent. above present output—from 54,600,000 tons to 97,000,000 tons in 1966, the last year of the Plan period. As part of the programme, private companies intend to expand existing facilities and open new mines to increase their annual production of coal from 44,000,000 to 61,000,000 tons, and the loan will make available the foreign exchange required to import equipment for this expansion.

Several hundred private collieries will participate in the expansion programme for which the loan has been approved. They represent all segments of the industry from small, individually-owned units to those forming large complexes of companies controlled by managing agents. The total cost of the programme to be carried out by the private coal industry during the Five-Year Plan is estimated at the equivalent of $116,000,000. It is expected that the private companies will be able to finance this expansion themselves, but will need access to foreign exchange for imported equipment.

The World Bank loan will provide $30,000,000 for imported spare parts, replacements, and equipment required during the first two years of the Plan period for the expansion of existing mines, and $5,000,000 for the opening of certain new mines which should take about four years to complete.

Emphasis on Coking Coal

The loan is for a term of 15 years and bears interest at the rate of 5¾ per cent. per annum including the 1 per cent. commission which is allocated to the Bank's special reserve. Amortization will begin in May, 1966. Four private banks are participating in the loan, without the World Bank's guarantee, to the extent of $875,000, representing portions of the first maturity which falls due in May, 1966.

India's abundant reserves of coal are among its most important natural resources and the basis of its industrialization. Half the country's electricity supplies are generated from coal, the railways are run almost entirely on coal, and expansion of the steel industry is predicated on large reserves of coking coal. Despite an icrease in the annual production of coal from 38,200,000 to 54,600,000 tons during the second Five-Year Plan, there was still a shortage which affected the growth of industrial production.

The coal production target of 97,000,000 tons was arrived at by a consideration of the requirements during the Plan period for all the principal uses of coal for railways, steel, electric power, brick kilns, cement, textiles, domestic coke and small industry, shipping and export, chemicals, foundries, paper, refractories, and glass. Emphasis will be placed on producing more coking coal used for steelmaking and other high quality coal, most of which comes from mines operated by private companies.

In view of the importance of the private coal industry to the attainment of this goal, the Government has taken a number of measures to enable the private companies to expand production, including a system of subsidies for mines with difficult operating conditions, permission to open new mines, and an assurance of policies favourable to continued production by private companies.

The Government is also taking steps to assist the industry through the provision of sand-stowing facilities. India's largest coal reserves are located in the states of West Bengal and Bihar in the north-eastern part of the country. Most of its operations are underground which in India require a special technique of mining because of the extraordinary thickness of the coal seams—some up to 100 ft. When coal is taken out it must be replaced with sand to permit the maximum to be recovered without cave-ins, so the availability of sand has an important bearing on the expansion of coal production. In order to increase facilities for sand-stowing, the Government will construct seven central ropeways from river-beds to supply sand to about 50 mines in the private sector.

A crucial problem facing the Indian coal industry today is transport. Virtually all the nation's coal is now moved by rail and since most of it is located in a relatively small area, it means a great concentration of rail traffic. Few mines have the space or facilities for stockpiling and are forced to curtail production very quickly if output cannot be moved. The Government therefore is taking measures to improve the facilities of the railways for the transport of coal and also to provide for the movement of greater quantities by coastal shipping. Transport will also be alleviated through the construction of washeries near the mines to decrease the ash content of coal, thereby reducing the bulk of the shipments to some extent.

Scots Miners' Presentation to Retiring President

RETIRING president of the Scottish Area of the National Union of Mineworkers, Mr. Abe Moffat was presented with a cheque for £1,000 at a social evening at Bilston (Midlothian) last Saturday. The presentation was made by Mr. J. Phillips, delegate from Lingerwood branch of the NUM, on behalf of miners in the Lothians Area of the Scottish coalfield.

Mr. Moffat also received a portrait of himself painted by a local miner artist. A highlight of the evening was the singing of "The Ballad of Abe Moffat" by the wife of a Polkemmet miner.

Personal

Holman Chief Engineer for World Symposium

CHIEF engineer of Holman Bros., Limited, mining, quarrying and pneumatic plant specialists, of Camborne (Cornwall), Mr. JAMES HODGE has been invited to lecture on rotary screw compressors at an International Symposium on Compressors to be held in Prague from September 6-8.

MR. JAMES HODGE

Organized by the Council of the Czechoslovak Scientific and Technical Society, the Symposium aims to find ways to reduce investment and operating costs of compressors and blowers, to prolong their operating life, to consider the possibilities of their automation and to find methods to "suppress their annoying effects on surroundings." Some 70 delegates will attend, and visits to industrial works and the Brno International Trade Fair have been arranged. Mr. Hodge will also spend some time at the Holman group stand at the Brno Fair, where examples of the company's Rotair, the first British oil-filled rotary screw compressor, will be on show.

Mr. Hodge joined the Holman group in 1959 from Power Jets (Research & Development), Limited, where he was chief engineer. Previous to this he spent two years with AERE, Harwell, where he was concerned with reactor design. His first experience of industrial life was as an apprentice at the Camborne works of Holman during vacations from Cambridge University.

After serving 26 years with Scammell Lorries, Limited, Watford (Herts), Mr. DOUGLAS BUCHANAN-SMITH, chief inspector for the company since 1943, is retiring this month.

Mr. GEOFFREY GOURIET, a technical director of the Wayne Kerr Laboratories, Limited, has left for the United States in connection with the company's promotion of its new servo system analysis technique.

Joint managing director of the David Brown Corporation, Limited, and a director of David Brown & Sons (Huddersfield), Limited, Mr. ALLAN AVISON has completed 50 years' service with the company. He began as an office boy at 5s. a week.

Mr. J. R. BEARD will be retiring from the partnership of Merz & McLellan, consulting engineers, of London, S.W.1, on December 31, but has agreed to continue with the firm as a consultant. Mr. A. E. POWELL will act as senior partner from January 1, 1962.

Prominent expert in metallurgy and research administration, Dr. FRANZ R. HENSEL, until recently vice-president of engineering of P. R. Mallory & Company, Inc., Indianapolis, Indiana, has joined Clyde Williams & Company, Columbus, Ohio, and its associated enterprises. He will be executive vice-president of the parent company, and president of the Clyde Williams Corporation, an international company providing research technical information, investment, advisory, and management services in the United States and Europe. Dr. Hensel studied in Germany and at Sheffield University before going to the US in 1929.

With the retirement of Mr. E. E. BEARD from Newton, Chambers & Company, Limited, Thorncliffe, near Sheffield, after 50 years' service, a century of father-and-son service with the company has ended. Mr. Beard's father worked for 57 years with the company's collieries. Mr. Beard himself began work with the firm as a boy of 13 at Thorpe Pit, and from 1941 to 1958 has worked at the Izal factory. An illness has kept him from work for the past three years.

Presentations were recently made to two retiring officials in the West Fife Area of the Scottish Divisional Coal Board. They were Mr. A. BELSHER, assistant Area general manager, who is leaving the district to live in Sussex, and Mr. JOHN ARCHIBALD, deputy Area production manager (planning). Mr. R. B. DUNN, Area production manager, who is leaving to take up a similar post in the Central East Area, also received a gift. Mr. T. D. M. SCRIMGEOUR, Area general manager, made the presentations.

New General Manager for Swansea Area, NCB

AT the age of 37, Mr. Donald Davies, Area production manager of the No. 4 (Aberdare) Area of the South-Western Divisional Coal Board, takes up a new job on Friday. He is to be general manager of the No. 1 (Swansea) Area, which covers 12 collieries employing 6,000 men, in succession to Mr. J. G. Tait, whose appointment as divisional industrial relations director was announced recently.

Mr. Davies graduated B.Sc.(Hons.) in the Mines Department at the University College, Cardiff, and also gained the Diploma in Metalliferous Mining. He joined Powell Duffryn, Limited, in 1942 as a student apprentice, later being appointed assistant colliery overman, overman, and undermanager. He was only 27 when he got his first managerial post—at Tower Colliery, No. 4 (Aberdare) Area, and he was later transferred as manager of Deep Navigation Colliery, also in that Area.

In 1955 he became group manager and in 1958, deputy Area production manager (operations) in the No. 6 (Monmouthshire) Area. He returned to Aberdare as production manager in February, 1960.

"REBEL" WINDING ENGINEMEN REJOINING NUM

ALL but 83 of the winding enginemen in the Scottish Area who left the National Union of Mineworkers to join the newly-formed "rebel" union—the National Union of Winding Enginemen—have rejoined the NUM. When the new union was formed, it made sweeping gains, said Mr. Charles Guest, the secretary. For instance, in the Lothian Area the union had recruited 80 per cent. of all colliery winding enginemen from the NUM and at Fife they got 50 per cent. to join them, but all had gone back to the NUM.

"The majority of our 83 Scottish members," added Mr. Guest, "are in the Ayr district. They are really staunch chaps who will form the backbone of our union." He admitted that at Durham, too, there had been losses, and in Wales they had lost quite a bit of ground.

"Rational" Policy for Coal

POLITICAL OBSTACLES MUST BE OVERCOME

SOME suggestions for a "rational" coal policy are put forward by the British Coal Exporters' Federation in a booklet which also provides an outline of some important contributions to recent discussion of national fuel policy and an analysis of some terms used in that discussion. Supporting, in the main, the aims of the coal industry as defined in a six-point policy by Lord Robens, the booklet's chief concern is the sector of coal policy which lies outside the National Coal Board's control or which at any rate requires the co-operation of other interests, including the Ministry of Power.

Foremost in a set of "political" principles which the federation thinks should merit the attention of the Government in fulfilling its responsibilities towards the British coal industry is the principle that the Government should accept and publicize the implications for a nationalized coal industry of being obliged to operate an "averaged-out" price system, which has been controlled by successive Governments in such a way as to prevent a profit in a shortage and to make a loss almost inevitable in a surplus.

It should assist the NCB to overcome political obstacles to the exercise of all those measures of flexibility which might assist the coal industry to maintain maximum stability through inevitable fluctuations in demand.

"Bring Coal into its Proper Place"

The Government should hold the balance between present and future consumers in respect of their freedom to choose from a wide range of fuels, including a reasonable supply of British coal. It should pay the closest attention to the oil element in our balance of payments and give the coal industry clear and early warning of any restrictions on oil imports which may be in the national interest and which may entail important increases in the coal component of future British energy budgets.

The federation feels that the Government should bring coal into its proper place in public understanding and esteem regardless of the political views of the Government of the day on the principle of nationalization. The Government is empowered by statute to ensure that the coal industry is operated in the national interest. The federation believes it should take equal care to make sure that the nation takes a proper interest in the operation of its coal industry.

Pointing out that forecasts of our total fuel requirements—certainly since 1945—have been materially falsified by events, the federation says that the coal industry ought rather to set its own targets on commercial and operational grounds (acting always as a good employer) and depart therefrom only on clear political directives, backed where appropriate by financial compensation from the public purse.

Discussing a statement made by Mr. Reginald Maudling, when House of Commons spokesman for the Ministry of Power, that the Government wished the fuel industries to operate, by and large, against a background of "normal commercial considerations," the booklet points out that, apart from price control, there has been insufficient realization by the Government and its predecessors of the large number of "normal commercial considerations" of which, largely for political reasons, the NCB has been unable to avail itself. Although every possible device for securing extra flexibility should be brought into play to offset inevitable swings in demand, some obvious political problems are revealed when those resources are examined.

Divided between the two opposed states of shortage and surplus, the resources are:—(Shortage) Employment of reserve capacity; extra working by current labour force; speeded-up recruitment, increased open-cast production; coal imports; recruitment of foreign workers; price increases to fend off demand and accumulate reserves. (Surplus) Large-scale stocking; increased exports; reduction in open-cast working; slowing down of recruitment; discharge of foreign workers; reduction of selling prices by recourse to financial reserves.

Apart from employment of reserve capacity, nearly all the measures require the approval and consent or acquiescence of other interests, such as unions and Government.

On the question of coal imports, the federation says that sooner or later Britain will have to choose between the survival of the delusion that the industry should be able indefinitely to supply exactly the types of solid fuel required at all times and places, or the ability of the industry to establish an effective image of reliability and certainty in coal supplies by drawing on marginal quantities of imports in times and at points of shortage.

On the point of how far the NCB should be free to use prices like other producers as a means of reconciling demand and supply at all points of the trade cycle, the federation says that this is a facility the board has never fully enjoyed.

An "averaged-out" as opposed to a marginal price structure, coupled with the repression of prices so as to prevent profits at times of shortage, has meant the NCB has had to face the current fuel surplus with no financial reserves and no prospect of reducing in general price levels without incurring serious financial deficits.

"It may well be that the steps taken by the Government in relation to price control have been, and are in, the national interest," says the federation. "Inasmuch as the coal industry is nationalized, there must be points at which it cannot operate on strictly commercial principles, but any areas of imposed non-commercial practice should be defined for it by the Minister and once they are defined, should be publicized, and if necessary paid for, in such a way as to square the board's accounts both literally and metaphorically in the eyes of the public."

Holman Chief Urges Need for Exports Aid

ENCOURAGEMENT to industry to export should be given by the Government by direct assistance in some form or other, probably related directly to each company's export business, as in other countries, urges Mr. P. M. Holman, chairman of Holman Bros., Limited, mining, quarrying, and pneumatic plant manufacturers, of Camborne (Cornwall), in his annual statement to shareholders. Such assistance would prove a real incentive to exporters in increasing exports, the crux of the present economic crisis, he believes.

Mr. Holman says that the company has been responsible for the export of millions of pounds of engineering equipment each year for many years, and much of its business has been obtained only as a result of considerable effort and risk. It was a great disappointment, therefore, that the Chancellor in his recent measures to assist the country's economy, did not find himself able to give any assistance to exports. On the contrary, the increase in the Bank rate was making even more costly the burden of carrying heavy stocks and granting the long-term credit associated with the export market.

Dealing with the current year, Mr. Holman says that orders outstanding at June 30 show a marginal reduction on the corresponding figure for the previous year, and the current rate of order intake is rather lower. With the added factor of recurring increases in costs he "cannot feel optimistic about what appears likely to be another difficult year, and one in which we shall do well to maintain the current level of profits." Oversea sales last year continued to expand and accounted for 71 per cent. of the group turnover.

CONTINUED RISE IN INDIA'S MINERAL OUTPUT

RISING trend in India's mineral production, evident since 1955, continued during 1960 and at Rs. 1,590,000,000 represented an increase of Rs. 180,000,000 or nearly 13 per cent. over the previous year. These figures do not include petroleum and atomic minerals. The rise was mainly in the output of coal, iron ore, bauxite, copper ore, china clay, dolomite, limestone, and salt. Coal output at 52,600,000 (46,070,000) metric tons, was valued at Rs. 1,089,000,000, 68 per cent. of the total value of mineral production.

Production of iron ore reached a peak of 10,680,000 metric tons, a rise of about 3,000,000 tons. Deliveries to domestic iron and steel plants rose to 7,230,000 (5,680,000) tons.

Expansion in the domestic aluminium, refractory, and chemical industry, as well as higher oversea demand, boosted bauxite production to an all-time peak of 384,000 tons, an increase of 75 per cent. The total value of metal production during 1960 was estimated at Rs. 1,948,000,000 (Rs. 1,554,000,000), an increase of nearly 25 per cent., due mainly to ferrous metals which rose by Rs. 384,000,000, or 27 per cent. Output of pig-iron, steel ingots, and finished steel was a record.

AN INTERNATIONAL CONFERENCE on the metallurgy of beryllium will be held at the Royal Commonwealth Society, Craven Street, London, between October 16 and 18. It has been arranged by the nuclear energy committee of the Institute of Metals.

Large US Tinplate Order Secured by SCOW

REGULAR shipments of tinplate to two American companies are to be started by the Steel Company of Wales, Limited. During October and November, 11,200 tons of tinplate will be shipped into San Francisco and other US west coast ports for delivery to the Continental Can Company and the American Can Company. To conform with the current trend in the United States, the bulk of these orders will be delivered in coil form and will constitute the biggest output of coiled tinplate hitherto produced by the company. The value of the contracts has not been disclosed.

A spokesman for the Steel Company of Wales said that the reason for the American companies buying British tinplate was that the SCOW price was more attractive. Mr. M. J. Layton, the company's sales controller, said: "It is essential that we keep in close touch with the qualities and practices required in the American tinplate market, and the best way of doing this is to be suppliers to the US can manufacturers. In accordance with the practices developed in recent years in America of using tinplate in coils, the bulk of the orders will be supplied in this form. We have been able to accept these orders because of our decision taken some years ago to instal equipment for the production of coiled tinplate."

The order is only the company's second in recent years to ship tinplate to America; the last was during the 1959 strike of US steelworkers.

British Group May Build Yugoslav Steel Plant

PRELIMINARY agreement has been reached in negotiations by a consortium of British engineering firms for a £28,000,000 contract to build a new integrated steelworks in Yugoslavia, and a decision on the final agreement is expected in the course of the next few months. The consortium concerned, Metallurgical Equipment Export Company, Limited (MEECO), includes Davy & United Engineering Company, Limited, Head, Wrightson & Company, Limited, Simon-Carves, Limited, EFCO, Limited, Joseph Parks & Son, Limited, and Wellman Smith Owen Engineering Corporation, Limited.

Although details have still to be finally settled, it is expected that the works will be built on a completely fresh site and have an annual capacity in the region of 330,000 tons. If the contract is awarded to Meeco, Head Wrightson is to be responsible for the overall engineering and supply of the iron-ore preparation plant, and for the oxygen steelmaking plant. The value of this work will be between £3,000,000 and £4,000,000.

Metallurgical Equipment Export has been involved in a number of large constructional contracts oversea. The largest of these was the £120,000,000 steelworks at Durgapur, for which Meeco joined forces with a number of other British companies to operate as the Indian Steelworks Construction Company, Limited.

LEICESTERSHIRE Education Committee expects to make a start on a new extension to Coalville Mining and Technical College, in the financial year 1964-65.

Obituary

Dr. W. A. MACFARLANE

President of the Institute of Fuel

MANAGING director of the National Industrial Fuel Efficiency Service and president of the Institute of Fuel, Dr. WILLIAM ANGUS MACFARLANE died at his home on Saturday. Born at Weston-super-Mare in 1908, Mr. Macfarlane was a King's Scholar at Westminster School, and went up to Oxford in 1926 with an Open Scholarship in Natural Sciences at Balliol College. He took a first class B.A. in the Final Honour School of Natural Sciences (Chemistry), and the research degree of B.Sc. in 1930.

Dr. Macfarlane remained at Balliol for two years as a demonstrator, and then gained a Commonwealth Fund Fellowship for research in chemistry at the University of California, where he was awarded a Ph.D. Returning to this country in 1934, he was appointed a junior scientific officer at the Fuel Research Station, Greenwich, under the late Dr. F. S. Sinnatt.

With the formation of the Ministry of Fuel and Power in 1941, he was appointed as Director of Fuel Efficiency, and continued in this post until 1948 when he went to the United States as Director of the United Kingdom Scientific Mission and Attaché for Scientific Questions, British Embassy, Washington.

Dr. Macfarlane was elected a member of the Institute of Fuel in 1943, and a Fellow in 1951, was a vice-president from 1955 to 1958, and was a member of the publications committee. He had served continuously on the council since 1947, and became president in October, 1960. He was made CBE in 1958.

MR. W. B. JOHNSTONE

PRESIDENT of the Clyde Shipbuilders' Association and past-president of the Clyde Shiprepairers' Association, Mr. WILLIAM B. JOHNSTONE died recently in Scotland. A director of Alexander Stephen & Sons, Limited, Linthouse, Glasgow, he was a former chairman of the Dry Dock Owners and Repairers Central Council and an ex member of the Institution of Engineers & Shipbuilders in Scotland. He was also a fellow of the Institute of Directors, and a past member of the technical committee of Lloyd's Register.

Mr. Johnstone served his apprenticeship as an engineer with A. & J. Inglis, Limited, Pointhouse, Glasgow. He joined Alexander Stephen & Sons as assistant repair works manager in 1915, later becoming manager of the repair department. He was appointed to the board of the company in 1947. Mr. Johnstone was made OBE in 1951.

MR. R. W. ROBSON

THE death has occurred of Mr. Robert William Robson, who began his mining career under his father at Mirfield Colliery, West Yorks, and later went to Baddesley Colliery, Warwickshire, as a surveyor. An appointment as undermanager at Granville Colliery (Staffs) followed, and from there he went to No. 1 Pit, West Cannock.

Mr. Robson later became manager of No. 5 Pit, West Cannock, and in 1930 he was appointed manager for the Chamber Colliery Company, Limited, Oldham (Lancs). He finished his career in the Doncaster area.

The death has occurred of Mr. R. PARKES, founder of Sellars & Parkes, Limited, spring manufacturers, of Nottingham.

Mr. CHARLES THOMPSON, a retired colliery undermanager, has died at Belmont (Co. Durham) at the age of 77. He retired in 1949.

Partner in the firm of Murray & Steven, Limited, confectionery machinery makers, of Glasgow, Mr. JOHN G. STEVEN died last week at the age of 65.

Director for 37 years of the Sunderland shipbuilding firm of Bartram & Sons, Limited, Mr. GEORGE H. BARTRAM has died at the age of 63. He retired from active work with the firm 20 years ago, but continued as a director.

The death occurred last week of Mr. FREDERICK BOND, sales director of Newton Bros. (Derby), Limited, manufacturing electrical engineers, of Derby. Associated with the firm since 1927, he was also a founder member and a past president of Derby Electrical Society.

Chairman of Wolseley Engineering, Limited, Birmingham, and a director of Wolseley-Hughes, Limited, Lt.-Col. NOEL CLIVE PHILLIPS died on Tuesday last week at the age of 78. Manager of the Bombay Burmah Trading Corporation before leaving Burma in 1931, he returned to the UK to take a leading part in the public life of Radnorshire, becoming High Sheriff of the county in 1938 and Deputy Lieutenant from 1943 to 1955.

The death has occurred of Mr. VICTOR RICHARDSON, former joint managing director of Hope's Heating & Engineering, Limited, a subsidiary of Henry Hope & Sons, Limited. He was 77. Joining the parent company early in the century, he later worked for the firm in Rangoon and Canada before joining an American subsidiary. In 1934 Mr. Richardson returned to the UK and was appointed a director of Hope's Heating & Engineering in 1940. He became joint managing director in 1948 and held that position until 1955 when ill health forced him to retire.

Appointments

Changes in the Opencast Executive

IT is announced by the National Coal Board that Mr. J. R. CASELEY, Director of Production, Opencast Executive, is to retire at the end of October. He is being retained as consultant to the Opencast Executive. Mr. F. C. BAKER, at present the executive's Finance Director, is to become Director-General, Opencast Executive; Mr. L. H. CLEMETSON has been appointed to the executive as director (Production), and Mr. C. H. ALLEN as Director (Finance), all three appointments dating from November 1.

Mr. Caseley became Director-General of Opencast Production Works in 1942 and he was Director of Production, Ministry of Fuel and Power, when opencast mining was transferred to the board in 1952.

He has been mainly responsible for sponsoring the introduction of new techniques and developing opencast mining to its present high standard of efficiency.

Mr. P. L. MCILMOYLE has been appointed assistant manager, purchasing department of Castrol, Limited.

Mr. E. W. RAE has been appointed to the Kemet division of Union Carbide, Limited, to promote the sales of Kemet solid tantalum capacitators.

Capt. G. R. B. PATTISON has been appointed deputy general manager of Plessey Nucleonics, Limited, Northampton, one of the Plessey Company, Limited, group.

Mr. R. F. N. OTWAY has joined the Head, Wrightson Export Company, Limited, as manager for Europe. He was previously with the Morgan Crucible Company, Limited.

Mr. JOHN BROOKER has been appointed representative in Kent, Sussex, and the London postal districts south of the Thames, for Stanley Works (Great Britain), Limited, manufacturers of joiners' tools, of Sheffield.

In order to concentrate on design, Mr. F. J. HOWARD has relinquished the post of works manager and technical director of the Globe Pneumatic Engineering Company, Limited, Romford (Essex). Mr. A. G. OSBORN has been appointed works manager and Mr. W. HOGARTH becomes assistant works manager (admin.).

With effect from September 1, Mr. R. O. KELLY becomes works manager at the Bradford Works of the International Harvester Company of Great Britain, Limited. Mr. Kelly, who has been with IH since 1951, takes over from Mr. Sven Sonander who, after 14 years' service with IH in Britain, is to be works manager at the Norrkoping Works of AB, International Harvester Company of Sweden.

Mr. BARRY CROWSTON has been appointed assistant director of technical information for Climax Molybdenum Company, a division of American Metal Climax, Inc. Before joining Climax, Mr. Crowston worked for four years as an apprentice metallurgist at Appleby-Frodingham Steel Company, branch of United Steel Companies, Limited. He later graduated with honours in metallurgy at Nottingham University.

LEEDS FIRM of Jonas Woodhead & Sons, Limited, laminated and coil spring manufacturers, etc., has established a subsidiary in Holland under the name of Jonas Woodhead Europe, NV, for the manufacture and assembly of shock absorbers and springs for ships and aircraft.

Chancellor's Economic Planning Proposals

ALTHOUGH criticizing the Chancellor of the Exchequer, Mr. Selwyn Lloyd, for his "dictatorial action" on wages and interference with arbitration machinery, leaders of the Trades Union Congress agreed at talks on Tuesday to study the Chancellor's proposals for the setting up of a body representative of the unions, employers, and the Government, to help to deal with long-term economic planning.

The joint body is expected to be smaller and more closely knit than the existing National Production Advisory Council or the Minister of Labour's National Joint Advisory Council, both of which meet quarterly and deal in too general terms to be of immediate practical help at a time of economic difficulty. It would be supplied with economic and other information by a special staff.

Leader of the TUC party, Mr. Harry Douglass, general secretary of the Iron and Steel Trades Federation, said afterwards that the Chancellor had been told that his measures to secure a wages pause were dictatorial action worthy of Mr. Kruschev rather than a democratic government. The TUC, despite the difficulties caused by the Chancellor's actions, would, however, take back for examination his plan for new machinery to deal with long-term planning.

Support for the Chancellor's plan was given by representatives of employers' organizations when they met Mr. Lloyd on Wednesday. Sir Norman Kipping, director-general of the Federation of British Industries, said after the meeting: "We found that the Chancellor and we were thinking along very similar lines. I am extremely hopeful that the trade unions will in the end decide to come along in this constructive effort. The object is to develop our economy so that with increased productivity we can obtain consistent advances in the standard of living."

In addition to the FBI, the British Employers' Confederation, the National Union of Manufacturers, and the Association of British Chambers of Commerce were represented at the meeting.

Plan to Reopen Undersea Cornish Tin Mine

CHAIRMAN and managing director of the Geevor Tin Mines, Limited, Mr. G. W. Simms, in his annual report, states that, although he said in his last report that there was no intention of attempting to de-water the undersea workings of the Levant Mine, in Cornwall, it had now been decided, after considerable geological investigation, to undertake this operation, and John Mowlem & Company, Limited, had been commissioned to do the work involved.

It is proposed to seal the breach in the sea bed and, if the result is satisfactory, to bring the mine again into working. In his opinion, a successful outcome, in spite of the heavy expense involved, will react favourably on the whole future of the company. Exploratory work has also been undertaken at Cligga with satisfactory results and it is now proposed to embark on the second stage of the work at a cost of £30,000.

If this is successful considerable capital will be required to develop the mine and at this stage an approach will be made to the Government to reduce the impact of present mine taxation on new mining enterprise.

SOME CONTRIBUTIONS TO MINE SAFETY

Development and Proving at the Central Research Establishment

by P. G. TAIGEL, B.Sc., Ph.D.(Eng.), M.I.Min.E., M.I.Mech.E.

The development and proving of appliances at the NCB's Central Engineering Establishment are described in this paper, which the author, Dr. P. G. Taigel, the establishment's chief proving engineer, presented at the annual conference of the National Association of Colliery Managers, held at Edinburgh from June 6 to 8. He lists some notable contributions to safety. After outlining the objectives and organization of the CEE he discusses the work of the development branches.

NO industry has pursued safety for so long under such arduous natural conditions or with such far-reaching research, documentation, and regulation as the coal-mining industry in Great Britain. As a consequence, mine management today, aided by the safety organization at all levels, applies a vast knowledge of mine safety as a continuous and positive activity.

The technological advance of recent years has been very rapid, and the developments which have taken place, particularly in the engineering field, have called for an intensive drive to maintain, or, if possible, improve safety standards. This task involves all branches of the production and reconstruction department, but, in particular, strata control, dust suppression, ventilation, coal blasting, and mechanization.

The Central Engineering Establishment, the most recently formed engineering organization in the department, has a major role to play. The establishment, set up to develop and test machines and equipment, was first considered in 1952. Site work began in 1954, and in 1956 the establishment came into being. It has since been building up experience in providing a development and proving service for the industry.

The purpose of CEE being to provide facilities for development and proving in the engineering field, with the object of improving safety and efficiency and increasing productivity in the industry, it must:—

(*a*) Keep under review the engineering practices and requirements in the industry.

(*b*) Develop existing equipment and design and produce prototypes of new equipment and components.

(*c*) Prepare technical specifications and designs of new equipment.

(*d*) Encourage British manufacturers of mining equipment to speed up development and introduce new techniques.

(*e*) Carry out acceptance trials of equipment in the prototype and production stages.

(*f*) Prove equipment developed within the establishment and also new equipment developed elsewhere.

(*g*) Evolve standards and methods of acceptance and testing to be used by the industry.

The organization of the establishment is split broadly into development and service branches. The director, Mr. R. F. Lansdown, and deputy director, Mr. C. J. Moss, control five development branches and four service branches.

The development branches are:—(1) Coal-face

equipment branch, dealing with all coal-face machinery development; (2) roadway equipment branch, dealing with such development as selective heading machinery, ripping machinery, supplies vehicles, and stowing; (3) tunnelling branch, dealing with all tunnelling equipment; (4) coal-preparation branch; (5) project assessment branch, dealing with economic and feasibility studies, and priorities in future development.

The service branches comprise:—(1) Technical services, covering electrical development, and having hydraulic transmissions and structural specialists (this branch also controls the drawing office services); (2) works services, which look after buildings, sites, and workshops, including instrument control maintenance and repair; (3) proving and acceptance branch, responsible for all trials and tests of equipment and materials developed by the establishment and for type testing equipment and materials purchased by the board; (4) administration branch, responsible for financial control, including costing and preparation and administration of revenue and capital budgets, all personnel matters, purchasing and stores, secretarial, and general services.

The total complement of the establishment is about 450, and of this total 40 per cent. are technical staff and 45 per cent. industrial staff. The ratio between development and proving is of the order of 75 per cent. to 25 per cent.

The responsibility for ensuring that all equipment for which the establishment is responsible is safe to go underground rests with the chief proving engineer. He must conduct tests and investigations to see as far as is practicable that both experimental equipment and prototype equipment conform to the mining regulations and are safe to use.

The projects now described do not present in full the whole programme of work in hand, but represent a selection only of those which make a positive contribution to safety. Time precludes dealing in detail with these projects, but it is hoped that all who are interested will seek full information by communicating with the director.

COAL-FACE AND ROADWAY DEVELOPMENT

Dust-suppression Jib

In collaboration with MRE, a number of experiments has been in progress with dust-suppression systems fitted to existing and new machines. Encouraging results have been achieved with both jib- and drum-mounted picks when flushed with water along the pick faces. The practical application of these experiments for jib-type cutters is given in CEE Coal-face Equipment Branch Report No. DC/60/5, which describes both the CEE dust-suppression jib (Fig. 1) and a modification developed by W. C. Best, of the Northern (N & C) Division.

Trials have been conducted in most divisions, and in every installation a marked improvement in visible dust suppression has been noted, together with, in most cases, a marked reduction of respirable dust concentration in the atmosphere, a typical reduction being 57 per cent. from 1591 pp/cc (1-5μ) to 691 for a longwall undercutter in carbonaceous shale.

The successful application of water to picks for dust suppression depends upon the following:—

(1) Water should flush the faces of the picks, and mix as intimately as possible with kervings as soon as possible after formation.

(2) To minimize flooding and waste the water should be applied only to the picks which are cutting.

(3) Water outlets should be as large as possible to minimize clogging, and the supply system as accessible as possible to ease maintenance.

(4) Construction of the supply system within the dimensions of the machine, to reduce vulnerability of the component parts.

A BJ-D shearer drum with an internal spray supply system for dust suppression based on these principles is now undergoing trials at Francis Colliery in the Scottish Division. The use of an internal spray supply is now used whenever possible in CEE developments.

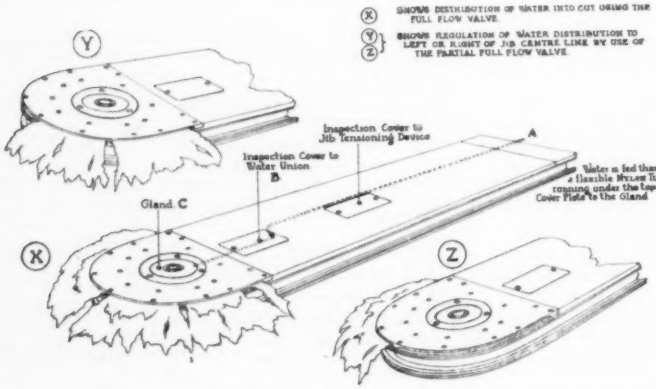
(X) SHOWS DISTRIBUTION OF WATER INTO CUT USING THE FULL FLOW VALVE.
(Y) (Z) SHOWS REGULATION OF WATER DISTRIBUTION TO LEFT OR RIGHT OF JIB CENTRE LINE BY USE OF THE PARTIAL FULL FLOW VALVE.
Y
Inspection Cover to Jib Tensioning Device
Inspection Cover to Water Union B
A
Water is fed through a flexible Nylon hose running under the top Cover Plate to the Gland
Gland C
X
Z

FIG. 1.—REDESIGNED WATER JIB, CENTRAL ENGINEERING ESTABLISHMENT.

Ripping Machine

The mechanization of face ripping was first suggested by Mr. C. V. Peake, of the East Midlands Division, and an experimental machine more in the form of a test rig (Fig. 2) was built and tried out first in a gypsum mine and later in Coppice Colliery, in No. 5 Area, East Midlands Division. The trials with this machine have been described.[1, 2]

Early experiments showed that dust was a major operational problem. A prototype machine has now been built for CEE by Joy-Sullivan, Limited (Fig. 3), incorporating an

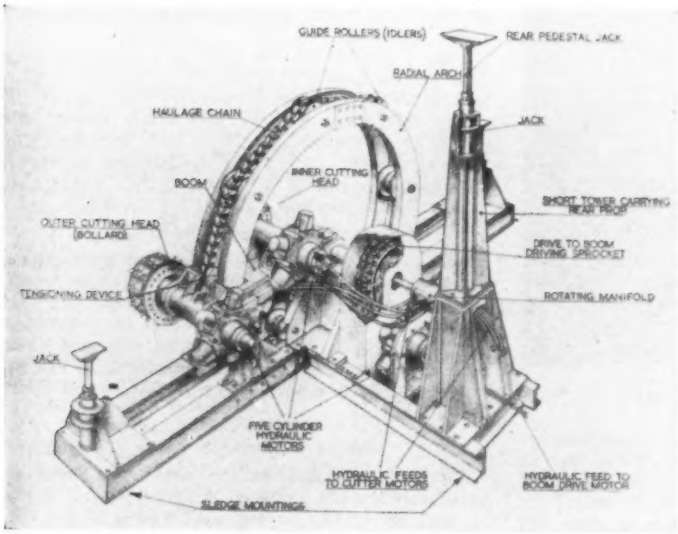

FIG. 2.—FACE RIPPING MACHINE, EXPERIMENTAL RIG.

internal spray supply for dust-suppression equipment, and is undergoing trials which show considerable promise in cutting medium hard shale with good dust control.

Kerf Ventilation

Methods of reducing ignitions in the machine cut have been investigated from several angles—water, foam, air, and combination of air and water. Hislop,[3] in a recent paper to the Mining Institute of Scotland, has shown that very considerable dilutions can be achieved by introducing some 60 cu. ft. of free air per min. into the undercut by means of compressed air mixed with water and passed through a modified "whale" jib. CEE has experimented with an air tube in which the air flow is induced by a water jet. The water jet is surrounded by a rectangular tube shaped to give a venturi effect (Fig. 4).

A considerable flow of air can be induced by this means, laboratory and field trials confirming that 120 cu. ft. of free air per min. can be obtained with a jet of 3 gal./min. of water at 300 lb./sq. in. gauge. The device has applications where a supply of compressed air is not available.

Hydraulic AFC Drive

CEE has been developing slow-speed hydraulic motors in conjunction with Chamberlain Industries, of Leytonstone, London. Starting with a five-cylinder prototype which was too small for an AFC drive, a seven-cylinder design was produced, which could use higher pressures and was of "monobloc" construction, giving a rugged and easily mounted motor.

The AFC drive (Fig. 5) has a working pressure of 2,000 lb./sq. in., giving a torque of 6,700 lb.-ft. at this pressure. Maximum pressure is 3,000 lb./sq. in. Fig. 6 shows the plan area for two AFC hydraulic motors and the comparable electric motors, each with traction coupling and gearbox. An installation has been running successfully at Swadlincote Colliery, in No. 7 Area, East Midlands, for some time. As well as the greatly reduced plan area, which permits the use of an adequate prop density, this hydraulic drive has no over-run on switching off the conveyor. This makes it an ideal drive for use in conjunction with automatic emergency stops on AFC mounted power loaders.

Radio-controlled Emergency Stop

The use of transistorized transmitting and receiving units has been considered for signalling problems underground. One project has been to design a transmitter fitted to a cap lamp battery

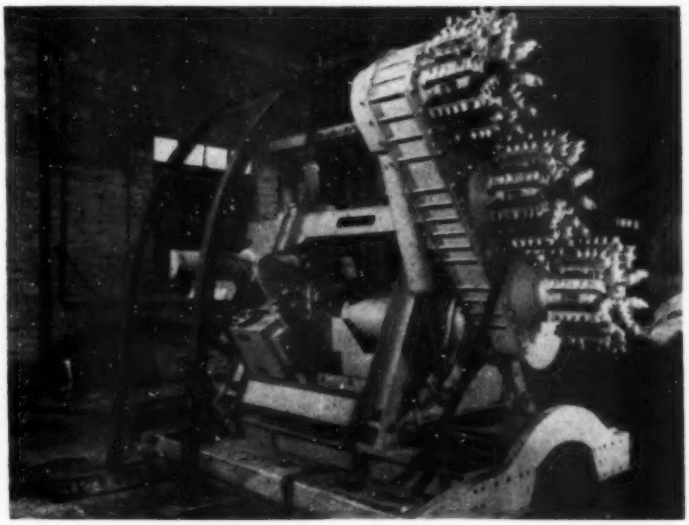

FIG. 3.—FACE RIPPING MACHINE, PROTOTYPE MODEL.

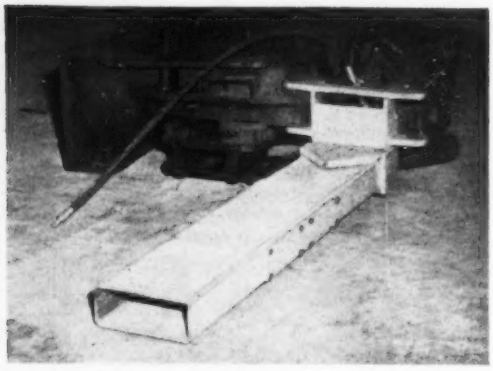

FIG. 4.—KERF VENTILATION.

which, when operated, will signal to a small receiver fitted to the machines to be stopped. When used in conjunction with a hydraulic drive to the AFC which has no over-run, and if made to stop both AFC and power loader, this emergency stop will overcome the dangers inherent in AFC mounted power loaders.

To permit the passage of the radio waves through the human body an operating frequency of 350 Kc/s has been chosen. This will give the machine operator complete freedom of movement around the machine.

At present, the mock-up made for surface trials has a range of 10-15 ft., but this can be increased if necessary. The medical profession uses a small transistor transmitter which can be swallowed to transmit information through the body to a receiver. The frequency used is similar in magnitude.

Bretby Conveyor Lifter

Lifting the goaf side of an armoured flexible conveyor to examine the underside or to set a new cutting horizon is normally done by using hand-operated ratchet or hydraulic lifting jacks. The Bretby lifter designed at CEE operates from the power pack and is built in as an integral part of the end covers of the pushing cylinders. The lifter is double acting and has a stroke of 6 in. The new control valve fitted to the pushing cylinders ensures that the lifting ram is retracted before the conveyor is pushed over, thus avoiding damage to the lifting ram.

This lifter has been successful in trials at Bestwood Colliery, East Midlands Division.

Stable Hole Machine

The Dawson-Miller in experimental form has been in use at Swadlincote Colliery, East Midlands Division, for some months, and has cut a 42-ft. wide stable 4 ft. 6 in. high for a trepanner advancing at an average rate of 20 in./hr. The best advance has been 8 ft. 6 in. in 3 hr. 30 min. Altogether, some 145 ft. advance has been made up to April, 1961.

Fig. 7 shows the machine in outline drawing. The picked wheel is driven by a FLP air-cooled motor of 15 h.p. which traverses the face of the stable hole over a conveyor which sweeps the debris in a continuous circuit until the discharge opening feeds it on to the discharging conveyor. This machine will, it is hoped, reduce stable hole labour by 60 per cent., and eliminate shotfiring.

Bretby Roller Stilt

The Bretby roller stilt makes use of the constant force required to deform plastically a steel strip around rollers, thus permitting a uniform yield load of the arch legs. The magnitude of the yield load is not affected by the setting of the stilt, nor is the amount of convergence. The stilt is simple to fit, being slid into the arch leg, and requires no other fitting.

Bretby Horsehead Bracket

To increase safety at the ripping, the Bretby horsehead bracket has been designed so that it can be securely locked to the arch and will not slip round the shoulders. Also, it can be securely locked to the horsehead girder to prevent the girder moving backwards from the ripping.

By correct design, it is suitable for the whole range of standard H-section arches and can be fitted at and removed from any point along the girder without having to thread it along the girder. Since it does not use screws, but relies on wedges, it is possible to remove it by blows from a long hammer while standing on the floor.

CEE Triple-web Roadhead Bar

The triple-web roadhead bar has been developed to resist deformation and retain a stable support system at the roadhead. It is a 4-in. deep double box section having a high resistance to twisting. Although only 15¼ lb./ft., it has a high bending strength, being more than twice as strong as a 4 in. by 4 in. by 15½ lb./ft. H-section. It is not necessary to harden and temper the material to achieve high strength, and it should have a useful life many times greater than an H-section girder.

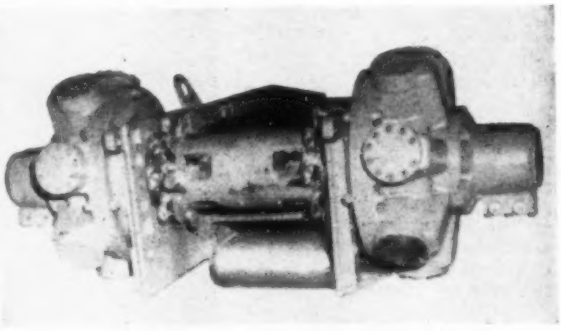

FIG. 5.—ACF DRIVE.

Protective Canopy and Arch Setter

The protective canopy development endeavours to protect personnel at the tunnel face and to assist in arch setting. The problem here is to devise adequate protection without making the working routine impossible.

The Mk. III canopy shown in Fig. 8 is designed for use in the following manner. The lowered canopy is moved up to the rock face and then raised under the newly blasted and unsupported roof while the rock spoil is removed. Next, the canopy is lowered to receive the arch crowns and then raised and the arch legs fitted. Again the canopy is lowered to form a working platform for the lagging of the newly created arches. The canopy can then be withdrawn to safety for the next firing.

The motive power for moving the canopy through the brackets fixed to the roadway arches is a Pikrose haulage winch mounted at the end of the main beam. The winch is also the motive power for raising the canopy. This is done by means of a chain fixed to the lower beam and passing over a pulley fixed to the forward end of the top beam. When the Pikrose winch is coupled to the chain the lower beam and canopy can be swung on the supporting arms up to roof level and pinned into position. Trials are in progress at Bilston Glen Colliery after modifications which were found to be necessary from damage sustained during firing.

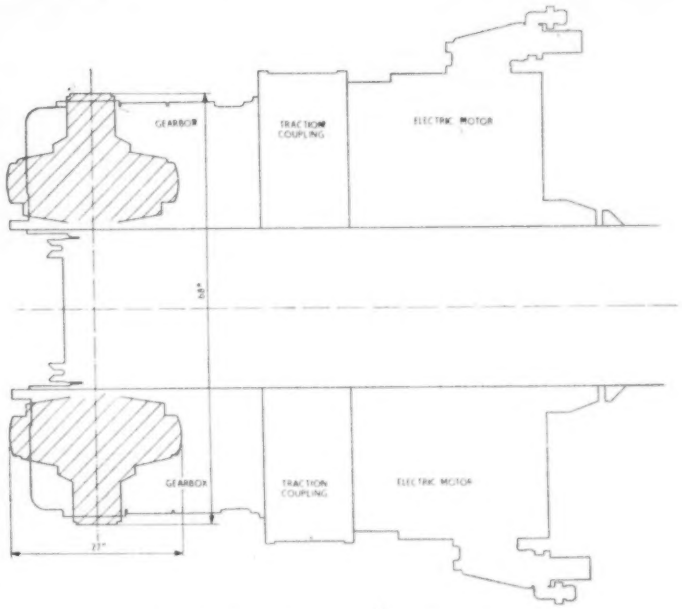

FIG. 6.—PLAN AREA OF AFC DRIVE HEAD.

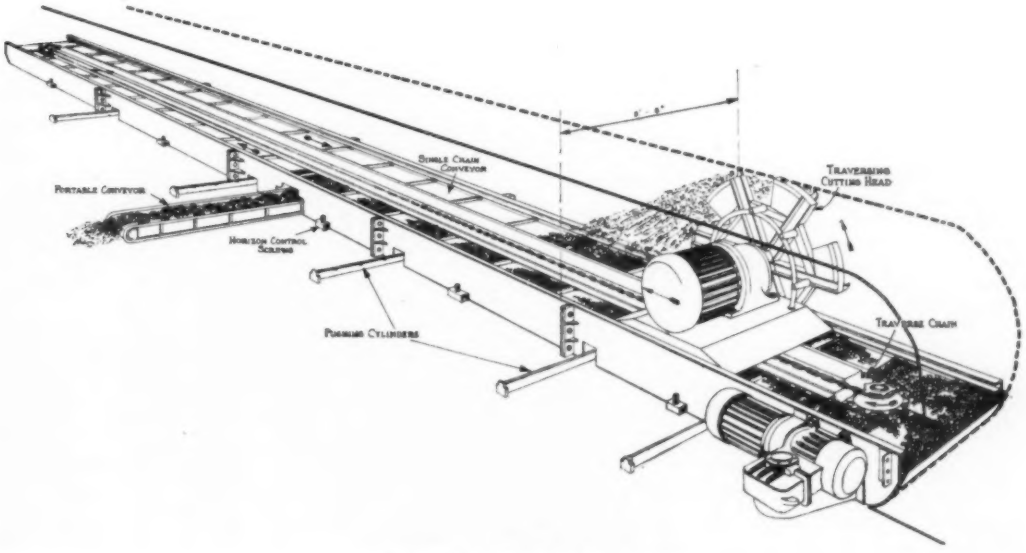

FIG. 7.—THE DAWSON-MILLER.

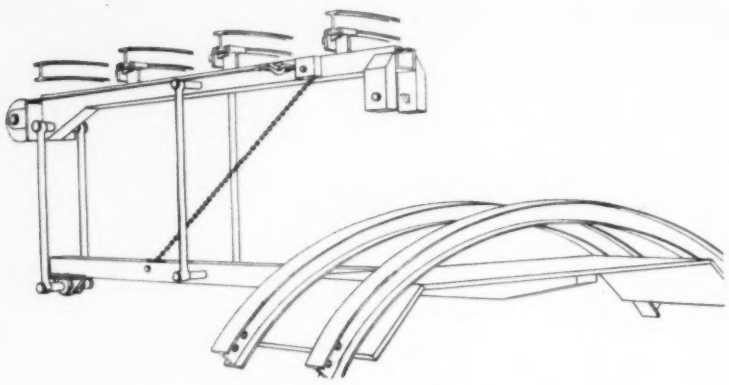

FIG. 8.—THE BRETBY MK IIIA CANOPY AND ARCH SETTER.

WORK OF THE PROVING AND ACCEPTANCE BRANCH

The Proving and Acceptance Branch of the Central Engineering Establishment is responsible for all trials run by the establishment, both laboratory and field, with the exception of those on coal-preparation equipment and the tunnelling machine, the special nature of these two projects making it more appropriate for them to be undertaken by the branches concerned.

The chief proving engineer is in charge of the branch and is assisted by a field trials manager, a mining engineer, a laboratory testing manager, a metallurgist, and an assistant chief proving engineer who is an electrical engineer. The assistant chief proving engineer is responsible for all electrical testing and the experimental power stowing station at Penallta, in South Wales.

The technical staff of the branch numbers just over 50, and some 20 to 30 industrial staff members are directly engaged on trials or testing, the number depending upon the trials demand.

Approval Tests

Certain items of equipment purchased by the board must now be of approved types and must have passed through specified approval tests conducted at Bretby and in some cases additional tests in the field. One of the most important aspects of this testing procedure is to ensure that the equipment is safe to use, and, furthermore, that production quantities do not deteriorate in any respect. This can only be done by follow-up tests on samples taken from the manufacturers' production line.

Some of the approval testing is now described.

Strata Control Equipment

All new forms of roof support equipment are submitted to CEE for examination and test before consideration is given by the Strata Control Branch to general purchase. At present, only yielding face supports and linked roof bars are allocated approval numbers, with purchase restricted to an approved list. Eventually, all forms of support equipment will be covered by the full approval scheme.

Standard testing procedures have been drawn up for yielding face supports and bars and agreed with the Safety in Mines Research Establishment. HM Inspectorate of Mines accepts CEE reports of tests on yielding supports and bars as the basis for its own assessment of the equipment and the granting of any exemptions. SMRE carries out independent tests when required to do so by the Inspectorate.

Although there are obvious commercial aspects, the main purpose of all tests is to ensure that the equipment functions properly and that no unsafe condition will arise as a result of malfunction, misuse, or wear. It is essential that pit trials should follow the laboratory assessment, and these are organized and carried out by the Strata Control Branch. Laboratory tests are again carried out after pit trials to check the performance against that found with the equipment submitted for approval.

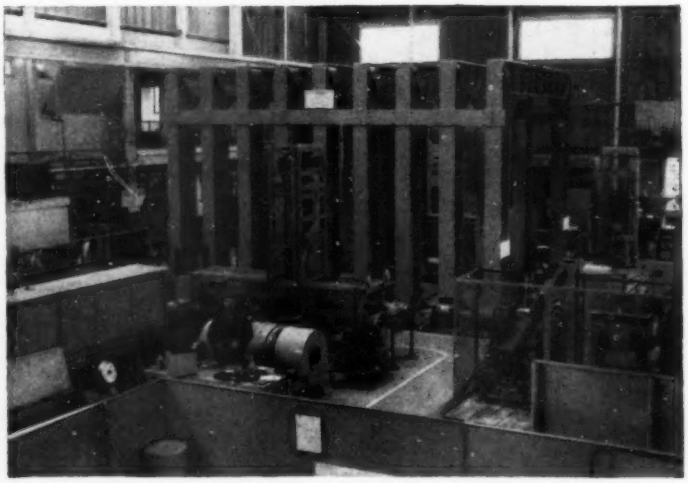

FIG. 9.—ARCH TESTING FRAME.

Choice of the materials used is also influenced by safety considerations. Apart from the ban imposed on light alloys because of the sparking hazard, brittle fracture is the main safety issue. Work is proceeding at MRE in this field, and the board is recommending adoption of a restricted list of materials chosen to avoid brittle fracture.

The testing facilities at present available for strata control equipment testing are:—Two 100-ton Avery universal testing machines, one cantilever link bar test frame, one 360-ton chock and prop testing machine, one reverse bend roof bar test frame, one powered support test frame, one friction cap test rig, and an arch testing frame (Fig. 9) which can accommodate some 10 to 12 arches fully stilted and strutted and is capable of applying loads up to 50 tons in selected positions around the arches.

Non-metallic Materials Approval

Conveyor belting has now been changed from rubber covering to PVC covering and the initial investigations at MRE have led to the establishment of a full-approval scheme controlling the purchase of all conveyor belting. The approval testing covers laboratory tests which ensure that all belts are adequately fire resistant and have acceptable electrostatic properties.

Additional laboratory tests are carried out to assess the probable life of the belt in service, and all new types of belt are subjected to underground trials before being given full approval. The safety aspects are, however, covered by the initial laboratory approval tests which have been developed following the Creswell disaster in September, 1950, and the board's decision to replace all rubber belting underground by fire-resistant belting.

The first and most obvious test, which is still used most successfully, is the flame test, in which a 12 in. by 1 in. piece of belting is heated in a flame for 30 sec. and the time of burning and/or glow after removal of the flame is recorded. The current NCB specification limits flame/glow time to 3 sec. for the normal belt and to 5 sec. for a belt with covers stripped.

The danger of ignition by frictional heating as opposed to a flame is assessed by the drum friction test. A 6-in. wide piece of belt, anchored at one end, is threaded 180 deg. over an 8-in. dia. drum rotating at 190 r.p.m. (*i.e.*, 400 ft./min.) and a 70-lb. tensioning weight is hung on the free end of the belt. The test is continued until the belt is destroyed, and if at any time the drum temperature exceeds 300 deg. C. or the belt glows or burns, the belt is unacceptable.

PVC is a good electrical insulator compared with rubber, and sparks resulted from the build-up of electrostatic charges on the belt discharging to the earthed structure. This led to the resistivity test, in which the resistance beween standard electrodes, one central and one as a concentric annulus, is determined, and is required to be not more than 300 megohms.

In addition to conveyor belting, the hazards associated with transmission belting of both flat and V section have been investigated at CEE and MRE. Draft specifications have been prepared, and preliminary approval tests are being carried out.

Similarly, the safety requirements of brattice cloth and flexible ventilation ducting and performance testing for leakage and resistance to pressure have been investigated and approval testing at CEE put in hand.

Investigations into belt-fastener performance and design will eventually lead to improved specifications, and testing will ensure more efficient and reliable joints. This is particularly important for installations using the newer types of high-tensile joint.

Non-destructive Testing

Much of the general investigational work carried out in the Proving and Acceptance Branch makes use of non-destructive testing methods. Considerable experience has been acquired in the application of these techniques to the examination of chains, shackles, detaching hooks, gears, springs, shafts, and ropes. The methods employed cover magnetic crack detection, gamma rays, and ultrasonic and magnetic defect investigation.

Wire Rope Testing

Many investigations have studied the magnetic method of rope testing, and at the International Winding Rope Conference at Ashhorne Hill in 1950 a number of countries demonstrated their confidence in the method and described tests carried out as routine rope examinations to assess the safety of the installations. CEE, at the request of the director of engineering, and in collaboration with Mr. A. E. Crook, who was then principal inspector of mechanical engineering in mines, purchased three of the instruments, two d.c. and one a.c., the Integra, ACMI, and the Semmelink, respectively, for evaluation first under laboratory conditions and finally for comparison in field trials.

It was known at that time that the instrument used in South Africa, designed by Semmelink and modified by Harvey, gave indications of deterioration not by showing discreet faults, but by a change in the shape of a characteristic "line" recorded for a particular rope. This instrument was also designed for detecting deterioration in stranded ropes as distinct from locked coil ropes.

Although the laboratory tests were planned round the detection of discreet faults in a short length (70 ft.) of locked-coil rope, the South African instrument was included, as it was desired to use this instrument in the field trials, but modified to detect with maximum efficiency on a locked-coil rope.

A special rig was built which accommodated 100 ft. of test rope and allowed the centre 70 ft. to contain known faults which could be traversed by the detecting instrument carried on a rail trolley hauled at controlled speed along the rope.

A "yardstick" for fault magnitude was obtained by taping additional wires on to the surface of the rope and arranging various widths of gap. This method is also being tried in field trials under actual service conditions. Typical records are shown in

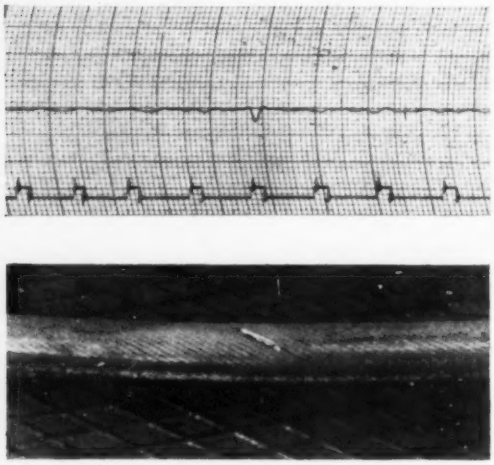

FIG. 10.—RECORDING ROPE FAULT MAGNITUDE.

Fig. 10. The Semmelink instrument does not respond well to this type of test. The other two instruments, both d.c., do show up individual faults where the gap distance is greater than 2 mm. In a specially made rope having known faults, almost all the faults were found by one of the d.c. instruments and none by the a.c. instrument.

The effect of varying tension and torsion on the rope was found to be negligible with these two instruments over the range of working load and torsion.

Field trials have, however, shown that small indications of magnetic flux disturbance have been recorded which on opening up the rope had no permanent defect as the cause. But no unexplained major deflections have as yet been found, and no defects have been found on opening up ropes which were not indicated on the NDT trace.

Investigations are proceeding to increase the sensitivity of the instruments and to simplify the practical application. For example, one d.c. instrument has 480 separate contacts which join one half of the magnetizing coil to the other. One faulty contact is all that is necessary to get no record.

A further problem yet to be solved is the separation of internal faults from external faults. A large internal fault may give the same record as a much smaller fault near to the surface.

Experiments are proceeding with tight and loose coupled search coils to see if the degree of coupling will affect the shape of the record to such an extent as to permit discrimination between internal and external faults.

Testing of Thick Walled Pipe by Ultrasonics

An example of the use of ultrasonic testing is shown in Fig.11 (*a*), which gives the paths of the ultrasonic waves for a search for surface defects. Fig. 11(*b*) shows the path for internal bore defects. The problem to be resolved here is the fitting of an automatic alarm for production use in tube inspection. The internal search path picks up external flaws, but as the bore internal flaws are repeated at 180 deg. phasing, manual inspection can resolve the problem, the operator ignoring the double reflection and noting the depth and position of the flaws indicated by the single deflection.

With this method of inspection it is possible to detect all flaws in the external surface and internal surface which are greater than five-thousandths of an inch deep. For all practical purposes, a depth of 10-thousandths can be used for initial rejection of pipe which has to work with fluctuating high pressure.

Magnetic Crack Detection of Gear Wheel Rims

Magnetic crack detection has a wide field of application and can be extremely useful in providing definite evidence of faulty welds, bad material containing inclusions, and faulty heat-treatment causing cracks. Fig. 12 shows some dirty material used in the rim of a gear wheel. Cracks forming at the tooth roots can be seen and were no doubt initiated by the stress-raising effect of the inherent flaws left on the surface after machining. The depth of cracks which are away from end surfaces cannot be gauged from surface inspection, however, and other methods must be employed to measure the extent of the flaws shown up by crack detection techniques.

Ultrasonics are useful where the geometry of the material or component is suitable. Another method is the use of gamma and X-rays.

Examination of Equipment by Gamma Ray

Fig. 13 shows a faulty weld which could not be detected by other means. Fig. 14 shows defects in cast-iron tubbing from a shaft lining. It is of the utmost importance in applying gamma and X-rays to material inspection to know how the film which shows the defect has been taken and processed, as well as to know what the defect shown means in terms of missing metal or inclusions

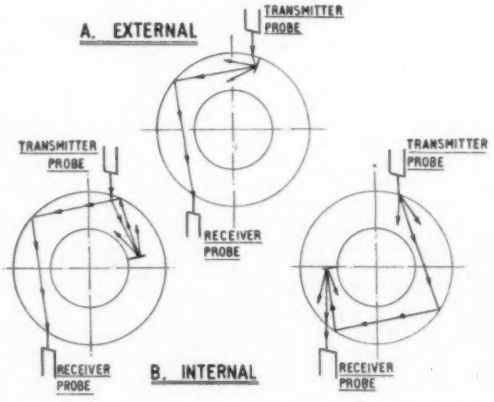

FIG. 11.—ULTRASONIC TESTING OF THICK-WALLED PIPE.

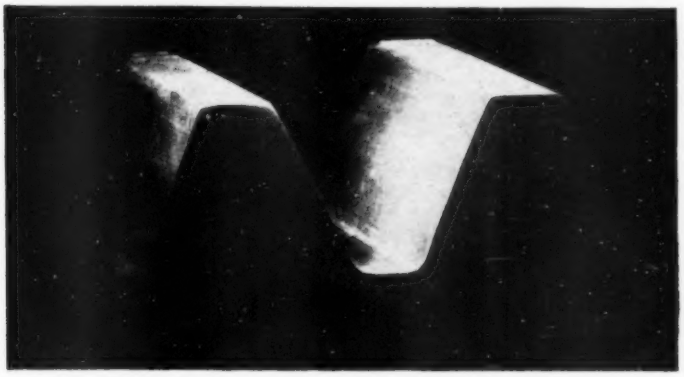

FIG. 12.—SECTION FROM SPUR WHEEL PHOTOGRAPHED UNDER ULTRA-VIOLET LIGHT, SHOWING ROOT CRACK.

present, type of fault and how formed in manufacture, and probable effect on the strength and life of the component.

The complexity of this method of inspection is not always appreciated, and it is essential that adequate training be given to the operating personnel and to the engineers who finally decide to accept or reject equipment.

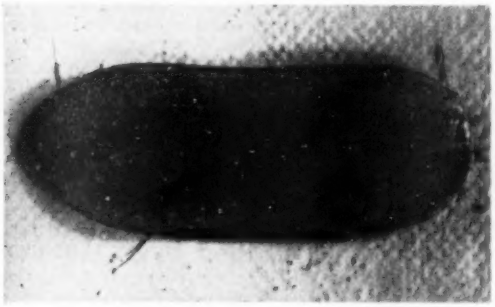

FIG. 13 (*a*).—SECTION FROM WROUGHT-IRON LINK (CAGE SUSPENSION CHAIN), SHOWING VOID. SEE RADIOGRAPH (BELOW) OBTAINED BEFORE SECTIONING.

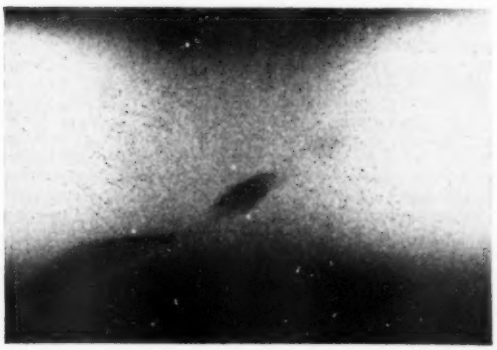

FIG. 13 (*b*).—RADIOGRAPH OF WROUGHT-IRON LINK (SEE ABOVE).

General Investigation

A considerable amount of engineering investigation is currently being undertaken for all branches in the production and reconstruction department, most investigations having a direct bearing on safety issues. Some are dealt with briefly to indicate the scope and nature of this work.

Friction Winder Linings.—Many types of friction winder lining have been tested in a specially built 5-ft. dia. friction winder pulley wheel on which a 1-in. dia. locked-coil winding rope is made to slip while under tension. Tests have been carried out under conditions of dry, wet, and oily ropes, and also with a smear of grease. It has been possible to determine the upper and lower limits of friction under these conditions and to select the most promising materials for further investigation.

Wear and dimensional stability trials must, however, be carried out before the final selection of the best materials can be made known. Unexpected occurrences have shown the need for a full knowledge of lining materials.

High-pressure Hydraulic and Pneumatic Testing.—The increasing use of air blasting, which eliminates shotfiring, has called for methods of testing steel line, connectors, cupro-nickel pipe, fuse tubes, hose, and hose couplings to ensure adequate standards of safety. The steel air line used has bursting strengths, when of sound con-

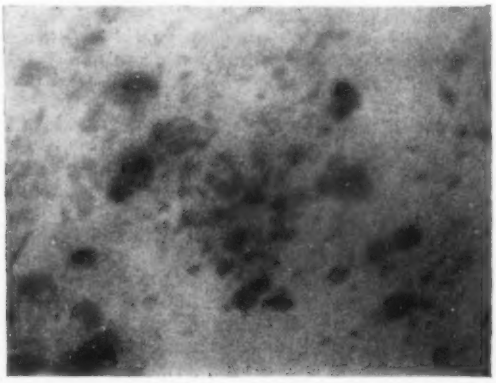

FIG. 14.—RADIOGRAPH OF PORTION OF CAST-IRON TUBBING SEGMENT, SHOWING POROSITY AND SAND INCLUSIONS.

struction, of 80,000-90,000 lb./sq. in., and hose of best quality 35,000 lb./sq. in. Equipment to test hydraulically up to 150,000 lb./sq. in. and pneumatically up to 60,000 lb./sq. in. has been set up at Bretby together with concrete test cells to contain the equipment under test.

Air line of defective manufacture will burst catastrophically, and such tube must be eliminated by adequate control of manufacture through correct specification and test. Air hose has been known to pass hydraulic tests, but to fail pneumatic tests at the same or lower pressure. The improvement in the construction of hose for fluctuating pressures to give an adequate life in the pit is being pursued in collaboration with the chief engineer of the Production Department and the hose manufacturers.

Strength of Mine-car Couplings.—A production instruction has been issued setting out the agreed tensile strengths of mine-car couplings. Some of these tests indicated a marked change of strength from that claimed by the makers, changes in design and in material having been made without adequate control or distinction between old and modified couplings. The establishment of agreed tensile strengths will be kept up to date as new couplings are introduced or old ones developed.

The life of couplings for mine cars under repeated impact is to be investigated, and a new rig is almost completed which will impact full cars at speeds up to 10 ft./sec. A fractured coupling received from a division for examination shows no obvious flaws and it is possible that it has reached the end of its life under repeated impact loads.

Acknowledgments

The author wishes to express his deep appreciation for the invitation extended to him by the president of the National Association of Colliery Managers to give this lecture and to draw attention to the exhibition showing some examples in the form of scale and life size models of the projects mentioned.

He also wishes to express his thanks to his colleagues at CEE who have helped in the preparation of this paper and to his director, Mr. R. F. Lansdown, for permission to give it.

All views expressed are those of the author and not necessarily those of the National Coal Board.

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[3] "The Application of a Compressed Air/Water Mixture to Prevent Ignitions of Firedamp in the Undercut," W. Hislop.

INTERNATIONAL COAL PREPARATION CONGRESS

FURTHER information concerning the fourth International Coal Preparation Congress, to be held at Harrogate (Yorks) from May 28 to June 1, 1962, is now available. All aspects of coal preparation will be covered, but emphasis will be placed upon:—(*a*) Relationship between feed, composition, plant design, and product quality; (*b*) classification of sizes below 12 mm. ($\frac{1}{2}$ in.); (*c*) treatment of fine material; (*d*) control of plant and products; (*e*) reduction in the free moisture content of material. About 35 papers will be read at the congress, which is being organized jointly by the National Coal Board and the Coal Preparation Plant Association.

The official congress languages will be English, French, and German. Simultaneous interpreting will be provided into all three languages.

Visits will be arranged to collieries and coal preparation plants during the congress. Delegates will have an opportunity of making two visits during the week of the meeting and arrangements will also be made for them to see other plants in the week following the congress if they wish to do so.

Evening functions for delegates and their wives and a full programme for the ladies while the sessions are in progress are being organized.

Full details may be obtained from the Secretary, Fourth International Coal Preparation Congress, National Coal Board, Hobart House, Grosvenor Place, London, S.W.1.

Liberian Mining Scheme's Progress

The Lamco Joint Venture mining scheme in Liberia made considerable progress in 1960, according to the annual report, published recently in Stockholm. Operations at the Nimba mine are scheduled to start in 1963, as originally planned. As from the date of registration of the company, in December, 1953, up to the end of 1960, a total of $33,350,000 has been spent. Construction work is being handled by the Swedish Grängesberg Company, which has set up a special department for Liberia. Contracts have been concluded for the building of a new port at Lower Buchanan, the railway to the Nimba mine, and roads in the mining district. Work on the railway between Lower Buchanan and Nimba (about 156 miles) was commenced in May, 1960, and by the end of the year about half the distance had been cleared for the start of actual construction work.

ALREADY WIDELY USED in America on applications involving chlorinating, defoaming, rust and scale inhibition, wash water detergents, cooling water treatment, and slime control, the FP micro H chemical feeder is now offered in Britain by Fischer & Porter, Limited, which is assembling it in its factory at Salterbeck Trading Estate, Workington (Cumberland).

British Welding Research Association

NEW ENGINEERING LABORATORY AT CAMBRIDGE

A clear case for the adequate financing of research was made by Lord Mills, the Paymaster-General, when he opened the new engineering laboratory of the British Welding Research Association at Abington Hall, Cambridge, recently. Acknowledging that great discoveries have sprung from great minds, even in the absence of adequate buildings and equipment, the Minister said that so many were the opportunities today and so great was the demand for the solution of scientific and technical problems that it was necessary to ally the potentially great minds with the right surroundings and equipment.

LORD MILLS said that a research organization hoping to attract imaginative and bright young men must provide reasonably satisfactory working conditions and equipment which did not result in continuous frustration.

The pace of technological development, he said, had enormously quickened and was still accelerating, and to get even half the answer to an important problem in a month might often be far more valuable than the whole answer in five years' time—when, in fact, the whole answer might have become quite useless. This again underlined the great importance of eliminating avoidable delay by having the right equipment at the right time, and sufficient of it. One example from the activities of the British Welding Research Association showed that without the facility of an electron microscope it could have worked for years on the problem of heat-affected zone cracking in stainless-steel steam pipes without getting anywhere.

It was only with the installation of this instrument that the association began to get some real clues to this problem.

Lord Mills said that the association started in 1946 with an income of less than £40,000, less than half-a-dozen research workers, in possession of a derelict country house, some stables, three army huts, and practically no equipment. He continued: "All of you who have supported the association from its very beginning can be very proud indeed of your achievement. The association and Abington Hall enjoy an international reputation, and there is, in fact, nothing quite like it anywhere in Europe—excepting Russia—or in America."

The New Laboratory

Some 700 visitors were present at the opening and afterwards toured the whole of the research station and the new laboratory. A few of the present research activities are described below.

The new engineering laboratory at Abington, now fully occupied with the exception of one wing, is a two-storey building providing an area of 15,000 sq. ft. on the ground floor and 8,200 sq. ft. on the upper floor. Like the other post-war buildings at the British Welding Research Association, it is a plastically designed all-welded steel-frame structure. Plastic design, which has ultimate load as its design criterion, has been developed in this country for rigid-pointed frameworks of mild steel which carry load by virtue of the resistance of their members to bending action. The accuracy of the plastic design methods, unlike that of the elastic or "classical" methods, is not affected by the occurrence of residual stress, sinking of supports, stress concentrations, etc. The principal advantage of the plastic method is the saving in steel which it allows.

The ground floor of the laboratory is laid out on the "open-plan" system without dividing walls between the various sections. Extensive use has been made of pastel shades in the interior decoration.

Ample window space and skylights provide excellent natural lighting. The upper floor consists entirely of office space, containing 15 offices in all. The ground floor houses the machinery and testing equipment of the pressure vessels, brittle fracture, and resistance welding sections, and the machine shop.

The pressure vessel section contains plant for testing vessels under pulsating and static pressure, and a high-pressure fatigue machine. The brittle fracture section houses 700- and 3,000-ton test rigs for tensile tests, and a Charpy machine. A 4,000-ton test rig is being built which will be capable of producing fracture in mild-steel plates 36 in. wide and 6 in. thick. The resistance welding section contains medium and heavy machines for spot and projection welding and micro-welding devices for welding strain gauge elements and electronic components.

Friction welding has been put to practical use in the Soviet Union and is being applied in a

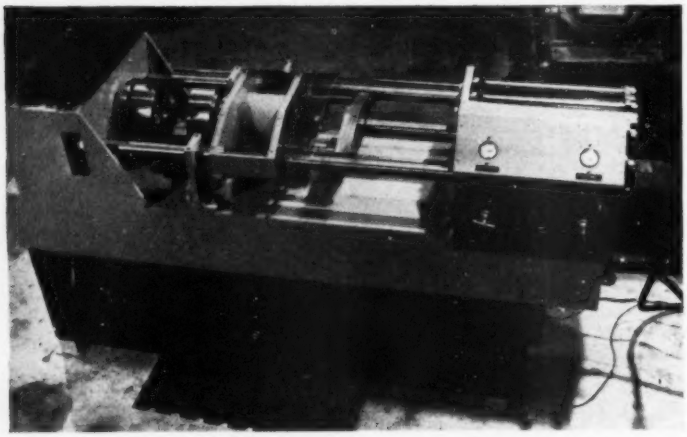


FIG. 1.—WHEN THE ENDS OF TWO BARS—ONE FIXED, THE OTHER ROTATING—ARE BROUGHT TOGETHER UNDER PRESSURE, THE HEAT GENERATED IS SUFFICIENT TO PRODUCE A WELD BETWEEN THE TWO COMPONENTS. FRICTION WELDING IS NOW AN ESTABLISHED PROCESS IN THE USSR. THE PHOTOGRAPH SHOWS A PROTOTYPE FRICTION MACHINE CONSTRUCTED AT THE LABORATORIES OF THE BWRA.

number of production plants. The BWRA is now assisting its application in Britain. Incidentally, British patents were taken out during 1941 and 1942, whereas the Russian patents were not registered until February, 1956.

The process is basically very simple. It consists of placing the ends of two bars in contact and rotating one of them, the frictional forces at the interface generating sufficient heat for welding to take place when the relative motion is stopped and sufficient force applied. Friction welding can be placed under the heading of pressure welding, the weld joint being made without the application of any external heat source. The process has some of the advantages of the more commonly known resistance welding processes, but, in addition, requires much less power.

The machine demonstrated and some of its products are shown in Figs. 1 and 2. It was made by the central machine shop, which forms the main service department for the establishment. Cost, manufacturing facilities, and time available to some extent dictated the design. Again, some aspects of the design have been influenced by the need for instrumentation with respect to existing recording equipment.

The machine has an approximate maximum welding capacity of 1 sq. in. in mild steel and is powered by a standard 10-h.p. motor at 950 r.p.m. The axial force is provided by a 12-in. dia. double-acting air cylinder, which, with the 100-lb./sq. in. air line, provides upset and friction forces to a maximum of 5 tons. The drive is by power-grip timing belt and stepped pulleys allowing speeds of 430, 640, 800, and 1,200 r.p.m. to be selected quickly and at a relatively low constructional cost.

The major mechanical problem involved is that of arresting the revolving head. The ways of doing this by a clutch, reversing the phases on the power supply to the motor or by capacitor injection, are all costly and would have added several months to the construction time. The alternative solution was to allow the stationary shaft to accelerate up to the speed of the decelerating driven shaft, which may also be further decelerated by a solenoid operated brake, to be added later.

Release of the stationary spindle is accomplished by means of a simple torque arm on the non-driven shaft, the arm being held against rotation by a pivoted cantilever which will eventually carry strain gauges to enable torque to be recorded. The cantilever is held in the stop position by a solenoid-operated latch. The solenoid can be energized automatically at any predetermined "burn-off" distance. The solenoid control circuit also trips the motor and operates the air valves, allowing the maximum force of the air cylinder to be applied to the work piece. A simple

FIG. 2.—THE EFFICIENCY OF THE FRICTION WELDING PROCESS IS CLEARLY DEMONSTRATED IN THIS PHOTOGRAPH, WHICH SHOWS WELDED ¾-IN. DIA. MILD-STEEL SPECIMENS AFTER BENDING AND TENSILE TESTS. AN AS-WELDED BAR IS SHOWN AT THE FOOT OF THE ILLUSTRATION.

beam is interposed between the cylinder push rod and the moving work head; this will eventually carry strain gauges so that friction and upset forces can be recorded.

Continuous Current Seam Welding of Stainless Steels

Seam welding is used in many industries for producing continuous, pressure-tight, welds. The basic principle of the process is that two sheets of metal are fed between a pair of copper electrode wheels while a high-amperage low-voltage current passes between them. The heating effect of the current is concentrated at the joint between the sheets and local fusion occurs.

A particular application is in fabricating parts of aircraft engines, and the British Welding Research Association has been determining acceptable welding conditions for joining stainless steels for this purpose. The conventional way of seam welding is to switch the current on and off at very short, regular, intervals to produce a series of overlapping welds. This produces satisfactory joints in most cases, but "interrupted" welds in some materials, especially in highly alloyed stainless steels, are liable to crack. It has been found that the uninterrupted use of an a.c. current for welding these materials eliminates the cracking, while it also appears that welding conditions are less critical than those for interrupted current. Strength tests and microscopic examination of the resulting welds are being carried out to confirm the suitability of the process (Fig. 3).

FIG. 3.—RECENT WORK AT THE BWRA HAS BEEN CONCERNED WITH THE SEAM WELDING OF STAINLESS STEELS BY CONTINUOUS, AS OPPOSED TO INTERRUPTED, A.C. CURRENT. TO DETERMINE THE PRESSURE TIGHTNESS OF THESE WELDS A "PILLOW" TEST IS USED IN WHICH TWO PLATES, ONE EQUIPPED WITH AN AIR NOZZLE, ARE WELDED TOGETHER ON ALL FOUR SIDES AND THE RESULTING "PACKAGE" IS INFLATED TO FAILURE. THE SPECIMEN SHOWN WITHSTOOD A PRESSURE OVER 1,400 LB./SQ. IN.

Two facets of the BWRA activities of special note are an advisory service for design for welding and a prototype welding service.

Welding, although well established in all its forms throughout industry, is still considered by many as a somewhat experimental process. This is partly the result of new discoveries—new welding processes are introduced every year—and partly the result of the fact that welding is continuously finding new fields of application. The growth of welding, however, has been meteoric. In the late 1940s there were few welded structures in this country; today, the nuclear power programme, high-temperature, high-pressure chemical processing—and the mass production of many household gadgets would be virtually impossible but for the development of suitable welding techniques.

Unfortunately, this growth in the application of welding has in no way been matched by the training of designers and even at this time the subject of design for welding receives little attention in technical education. Because the basic principle of welding is a simple one, the metallurgical changes which result from the heating and cooling of the metal, and their effect on the mechanical properties of the resultant structure are frequently disregarded. The selection of material for its high strength, for example, may be completely nullified by the wrong approach to detail design, or by incorrect welding, and there are many cases where structures involving such materials have an overall strength only marginally, if at all, higher than that which would have resulted from the use of cheaper material.

Problem of Fatigue

Another aspect of the lack of training in design for welding is the limited general application of the problem of fatigue. Very many structures, from crane gantries to motor-car bodies are subjected to changes in loading conditions which give rise to fatigue effects. It is not a phenomenon peculiar to aircraft, although it is in this context that it is most frequently discussed, solely because of the more usual totality of failure when an aeroplane is involved. The attention brought to a number of the fatigue failures in diesel engines, excavators, press frames, etc., derives only from the fact that they are recurrent. Many others, particularly in "one-off" constructions are welded up during routine maintenance and are not regarded as attributable to incorrect design.

To put the matter of design into perspective, more and more formerly cast structures are being replaced by welded constructions—machine bedplates are a typical case—but designs have been seen where the pouring gates in the former type of construction have been simulated in the welded article.

It is evident that much more attention must be paid to the training of designers based, first, on a thorough knowledge of welding processes and the effects of welding on the mechanical properties of the materials used and, secondly, on the con-

Future of Ironmaking

TITLE of the symposium that forms the major technical subject of the Iron and Steel Institute's autumn general meeting is "The Future of Ironmaking in the Blast Furnace." Experts from Belgium, France, the UK, and the USA have contributed papers for the four sessions, which cover injection processes, hot-blast stoves, burden preparation, and furnace engineering, respectively.

There will also be a series of parallel scientific sessions, devoted to the thermodynamics of slags, oxidation and scale, bainite, and the effect of steelmaking practice on the mechanical properties of alloy steels.

The Iron and Steel Engineers' Group has been responsible for organizing a session on the effect of the various steelmaking processes on the energy balance of integrated iron and steel works; this will follow the symposium on ironmaking.

The symposium on ironmaking and the session on the energy balance of integrated iron and steel works will be held at the Federation of British Industries, Tothill Street, London, S.W.1, on November 29 and 30 and December 1, respectively. The parallel sessions will take place at the offices of the institute at 4, Grosvenor Gardens, S.W.1, on November 29 and 30.

servatism which is the hallmark of good welding design, *i.e.*, the strict avoidance of purely decorative attachments in the form of gussets, stiffeners, and webs. While such training must, inevitably, take time, provision exists for fabricators to obtain advice on problems of construction with which they may not be familiar, or to obtain critical appraisal of designs they have produced. The BWRA, with the aid of the Department of Scientific and Industrial Research, operates a design advisory service to which designs may be submitted and with which industrial design staffs can discuss their own particular problems. Among the many facilities at its disposal the service is equipped with a mobile stress laboratory to enable strain gauging and other tests to be carried out on site when necessary.

When new lines are being put into production, advice is frequently needed as to the most suitable welding method to be used. Facilities exist at the BWRA's laboratories for welding with the majority of processes available to industry, these being backed up with excellent equipment for, and experience in, instrumentation. With the help of the DSIR it has been possible to extend these facilities, adding, for example, manipulators and jigs, so that the association can now make trial welds on production prototypes. Apart from establishing optimum welding conditions for the product the service helps (*a*) to show what can be done with a new welding process for which the member may not be equipped—this is a valuable guide to the selection of new plant—and (*b*) to compare the use of different processes on the same job to aid in process selection. Advice is given on the basis of the best type of process for the job, rather than as a recommendation for specific equipment. In fact, great care is taken not to be partisan in the giving of advice. Manufacturers of welding equipment, however, work closely with the association in providing the service.

As an example of the prototype service, help was recently sought with the selection of a process for welding small 16 s.w.g. mild-steel cylinders. It was demonstrated that, by changing to a new welding process, the cylinder could be produced in well under half the time taken by the method already operated by the manufacturer.

BRITISH STANDARD FOR FORKS, SHOVELS, AND SPADES

IN producing a British Standard for general-purpose forks, shovels, and spades (BS 3388: Part 1) the BSI has faced a difficult task, largely because the industry has grown over several centuries during which time no limit has been imposed on the number of variations of the basic designs, many of which are slight. Some design preferences are purely regional ones. The BSI's approach has been to fix a standard preferred range of tools covering all fields of general usage which can be manufactured with considerably greater economy. The stronger design preferences outside the preferred range are recognized, but it is hoped that as the standard is put into practice, users will become more and more reluctant to demand their production.

The specification also deals with nomenclature, materials, heat treatment and hardness, manufacture, dimensions, finish, and marking. Tests are laid down which ensure that the finished product will withstand rough usage.

Copies of the standard may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1, price 15s. each (postage extra).

Controlling Fires in Inactive Coal Deposits

Lessons learned while fighting 70 fires in abandoned mines and other inactive coal deposits are summed up by the Bureau of Mines, US Department of the Interior, in a 105-page illustrated report designed as a guide for public officials, for the mining industry, and for contractors concerned with extinguishing such fires. Since 1949, Congress has been providing funds for control of fires in inactive coal deposits, and the Bureau of Mines has used this money to save millions of tons of valuable fuel at a cost of less than 2d. a ton. Bulletin 590, "Control of Fires in Inactive Coal Formations in the United States," can be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, DC, at 60 cents each.

Improvements in the

HOT-BLAST VALVES OF HOT-BLAST STOVES

In this paper, translated from Metallurg, 1960, V, No. 9, pp. 9-10, the authors, N. I. Selin and G. G. Rutkovskii, of the Nizhne-Tagil' integrated steelworks, describe various measures taken to prevent leakages at the valves of hot-blast stoves, tuyere fittings, and other assess points in blast-furnace plant.

IN the blast-furnace department of the Nizhne-Tagil' integrated steelworks, in order to prevent occurrences of leakages through the flanges, the fastening of the valve to the connecting pipes was strengthened by means of bolts 30 mm. in diameter with nuts 50 mm. deep. Formerly, bolts 22 mm. in diameter and nuts 18 to 20 mm. deep had been used; when the flanges were tightened down, the bolts sheared and the thread on the nuts stripped.

With the weak bolts it was impossible to tighten down hard on the round, asbestos, packing string of 25 mm. dia., and, in consequence, the joints were not tight and leakage occurred. The round asbestos string was replaced by a ring packing, fastened with an overlap, and made from light sheet iron, 80 mm. wide. The external diameter of the packing ring was determined by the distance between the bolts along a diameter of the flange. After fastening, the packing ring is tightly packed with asbestos string of 2 to 2.5 mm. dia., one turn against the next. The turns of the first layer of asbestos string are laid at an angle of 30 deg. to the diameter of the packing ring, and the coils of the second layer are wound at an angle of 30 deg. to the opposite side. The thickness of the packing ring is 8 to 10 mm. Before fitting the packing ring, it is moistened with water-glass or salt solution and inserted between the flanges after 2 to 3 min.

Similar packing rings of appropriate dimensions are also used for packing the tuyere fittings, observation windows, blast main manholes, flanges, gas seal, cold-blast valve, and at many other points. The strengthened bolts and nuts make it possible to compress the packing to 2 to 2.5 mm. After 24 hr. the bolts are tightened down for the second time. In consequence, in the period from 1950 to 1960 there were no instances of leakage through the flanges. The need to cool the flanges of the air main with water was avoided.

Length of Service

The valve-packing rings fracture fundamentally as a result of the thermal stresses under the conditions of the high temperatures employed. The internal wall operates under extremely severe conditions. Being subject to the action of the blast, it is under the action of high thermal stress, though this load is decreased if the gate valve is closed. The alternate heating and cooling of the internal wall leads to fractures of the corners of the ring on a considerably greater scale than that of the remaining sections of the wall. Dependent on the quality of manufacture of the ring, they remain in service from one to 12 months or more.

In 1954 the system of delivery and withdrawal of the water was altered. Whereas earlier the water was delivered to, and withdrawn from, the ring at the bottom only, now a start was made in introducing it at two points at the bottom, and withdrawing it from two points at the top. The temperature gradient of the water was reduced by 50 per cent., and the working life of the ring increased by 100 to 150 per cent., but the thermal stress on the ring remained the same as before.

As an experiment, the ring of one valve was lined with fireclay brick, with a reduction in the internal diameter of the passage from 1,100 to 860 mm. in the form of a venturi tube. The life of the lining was good, and the temperature gradient of the water fell to 2 deg. to 3 deg. C. The valve operated satisfactorily for three years, and was taken out of service due to cracks in the body, while the rings remained intact.

At the end of 1959 and start of 1960, in the hot-blast stoves of three blast furnaces the rings were lined with brick. The effectiveness of the measures adopted may be judged from the following data. During 1959, 15 valves were replaced in the 13 hot-blast stoves, while at the Dzerzhinsk works 36 valves were changed on the 18 hot-blast stoves. A thermocouple introduced into the connecting branch main of the valve at a distance of 800 mm. from it, showed that during the air period the temperature reaches 1,120 deg. C., and falls during the heating period to between 400 and 450 deg. C. as a result of the formation of a gas cushion in the branch pipe, which refutes assumptions that premature fracture of the ring and the clapper occur at high temperature during the heating period. Assumptions that the ring fractures as a result of the formation of gas pockets in the upper part of the internal cavity of the rings and of the clapper were not confirmed.

Cracks in the clapper always become apparent at the bottom, and pockets are formed at the top, where fractures never occur. The ring, however, may fracture at any point on the circumference with the formation of longitudinal and transverse cracks.

The apertures in the flanges of the valve and of the branch pipes should be made oval. If round holes are used, when they do not line up it is necessary to open up the holes with an oxy-acetylene torch, which has an adverse effect on the valve. The surface uniting the contact part of the flanges with the (ring) packing must be smooth and 60 to 80 mm. wide. The thickness of the flange should be not less than 45 mm. Flanges 25 to 30 mm. thick become bent and tighten down before the packing makes a gas-tight seal. In addition, under such conditions fracture of the flanges is possible, and breaking off of the external casing of the body of the valve. The apertures in the cocks of the mains leading to the valve should be wide, so that dirt does not accumulate in them. The outgoing water from the valve should be ejected 1.5 to 2.0 m. above the ring, in order to set up a certain head of water in the rings. It is also necessary to cut out the possibility that the water will pass out of the ring, if its flow is diminished. During each day-shift the temperature of the water must be measured and recorded as a check.

The connecting rods of the clapper are greased two or three times in 24 hr. in order to preserve the packing glands and avoid leakages of hot blast. In the valve bronze may be replaced by mild steel, without lowering the reliability and working life of the valve. The steel rings should be rolled from billet in a rail tyre mill. The number of bolts on the flange should be reduced from 48 to 38, increasing their diameter from 30 to 32 mm. In this event there is an increase in the strength of the flanges.

The use of "Karpenko's goggles" (or plate-gate valves; see Stal in English, 1959, p. 807, or Stal', 1959, pp. 977-8) makes it necessary to stop the blast furnace twice to replace the hot-blast valves, which increases blast losses, stoppages of the furnace, and expenditure of water for cooling. Their use cannot therefore be recommended. Taking into consideration instances of burning through and melting of the walls of the combustion chambers of hot-blast stoves, owing to incomplete sealing of the hot-blast valves during the heating period, it is also impossible to recommend that the metal rings in a hot-blast valve should be replaced by ceramic ones (see Metallurg, 1959, No. 10), because of the possible escape of hot blast into the combustion chamber.

Cooling the flanges of the branch pipes of the hot-blast main at the Makeevsk Works increased their period of service, but did not do away with leakages through the flanges. At the Magnitogorsk integrated works valves of the gate type have been replaced by plate-type valves, which are cheaper and permit rapid replacement of the components. But such valves do not ensure adequate sealing due to the possibility that the axes of the plate and its seat become misaligned, and also through the presence of a rigid link between the valve and the connecting rod. In addition, much dirt collects in the plate.

A considerable part of the seat and of the valve are subject to the action of blast heated to high temperatures. Thus, the total working life of the plate and the seat is six to eight months.

In many works in the metallurgical industry a more successful design is being sought for the hot-blast valves.

It seems to us that the valves installed in the hot-blast stoves at our works may confidently be recommended to other works.

BRITISH IRON AND STEEL INDUSTRY

Translation Service

FOLLOWING is a list of some new translations available from the Iron and Steel Institute under its translation service scheme. Translations are all classified by numbers, and these should be quoted on applications, which should be addressed to the institute at 4, Grosvenor Gardens, London, S.W.1.

1594: "Comminution in Vibratory Mills." W. BATEL. Chemie-Ingenieur-Technik, 1958, 30, Sept., 567-572. £4 15s.

1676: "The Calculation and Operational Safety of Steam Boilers." P. BETTZIECHE. Hutnické Listy (Prague), 1959, 14 (12), 1169-1171. £2 10s.

1726: "The Significance of the Latest Technical Progress on Reconstruction of the Rolling Mill of an Integrated Iron and Steel Works with Special Reference to the Light-section Mill Train." H. SCHMIEDING. Stahl Eisen, 1960, 80, Feb. 4, 150-159. £6.

1763: "Problems of Cutting Temperatures During Machining." W. LEHWALD. Industrie-Anzeiger, 1959, 81, Aug. 4, 27-30. £4 5s.

2006: "Determination of Oxide Inclusions in Killed and Partially Killed Carbon and Low-alloy Steels." E. PIPER, *et al.* Radex Rund., 1957, Sept., 727-737. £4.

2015: "The Effect of the Thickness and the Thermal Conductivities of the Refractory Linings in the Blast-furnace Bottom on the Temperature Field of the Bottom—I." WAN SHU-MING. Acta Met. Sin. (Peking), 1959, 4, Sept., 195-205. £15.

2016: "Some Problems of the Heat Flow Through the Blast-furnace Hearth with Carbon Lining—II."

WAN SHU-MING. Acta Met. Sin. (Peking), 1959, 4, Sept., 206-216. £15.

2044: "Structural Examination of Iron and Steel with the Electron Microscope." A. SHRADER. Schweizer Archiv, 1960, Apr., 163-170. £4 10s.

2046: "Spectrometric Ultimate Analysis of Crude and Industrial Silicate Materials." H. RICHTER and S. JOHANSSON. Tonind.-Ztg.u.Keram. Rund., 1960, 84, Feb. 20, 77-88. £6 5s.

2114: "The Behaviour of the Mechanical Properties of Ferro-magnetic Materials in a Magnetic Field—II." H. JAHN. Die Technik, 1958, 13 (2), 94-99. £5 5s.

2123: "Stabilizing Annealing and its Effect on the Corrosion-resistance of 1Kh18 N9 T Steel." A. A. BABAKOV and E. N. KAREVA. Spetsial'nye Stali i Splavy, Sbornik trudov, vypusk 17 (Special steels and alloys. Coll. of papers, issue No. 17). Tsentr. Nauch-Issled. Inst. Chernoi Met. (TsNIIChermet) —Inst. Kachestvennykh stalei, pp. 204-227. Moscow, Metallurgizdat, 1960. £7 5s.

2124: "The Susceptibility of Chromium-nickel-molybdenum-copper Steels to Intergranular Corrosion." E. V. ZOTOVA. *Ibid.*, 295-310. £4 5s.

2126: "Pitting of Chromium Stainless Steels." A. A. BABAKOV and D. G. TUFANOV. *Ibid.*, 184-203. £5 10s.

2161: "Screws in the High-temperature Range." E. STANGE. Elecktrizitätswirtschaft, 1960, 18, Sept. 20, 642-646. £3.

2165: "Inhibiting the Strain Ageing of Non-alloy, Low-carbon Structural Steels by Means of Phosphorus." F. ERDMANN-JESNITZER, *et al.* Bergakademie. 1960, 10, Oct., 559-567. £5 15s.

2178: "Metallographic Investigation of Cracks in High-temperature Steel Creep Specimens." E. HORN. DEW Techn. Ber., 1961 (1), 17-19. £2 5s.

2194: "The Welding Behaviour of Chemically Resistant Cr-Ni Steels with Higher Mo and Mo-Cu Contents." A. SCHMIDT. Schweisstechnik, 1958, 12, Dec., 153-156. £3.

2261: "A New Light-section Rolling Mill for Special Steel." G. BERSA. Stahl Eisen, 1961, 81, Apr. 27, 572-578. £4 15s.

2267: "Investigation Under Operating Conditions of a Hot Slab or Billet Shear." H. KREULITSCH. Bänder, Bleche, Rohre, 1961, Jan., 1-5. £3 15s.

2270: "Isothermal Transformation Diagrams for Martensitic Stainless Steels Adopted as Swedish Standard." G. MOLINDER. Jernkont. Tekn. Råd, Medd., 1961, 20 (261), 723-732. £2.

2277: "Measurements of the Flow of Coal Dusts in Pipelines." E. HÜBEL. V.G.B. Mitt., 1960, Aug., 230-42. £5 5s.

2303: "Modernization of Equipment and Speeding Up the Processes of Manufacturing Phthalic Anhydride." M. I. LITVINENKO. Zhur. Vsesoyuz. Khim. Obshchestva, 1961, 6 (1), 81-7. £5 10s.

2304: "The Effect of Manganese Content on Ingot Mould Life." K-L. KIESEL. Neue Hütte, 1961, 6, May, 284-291. £3 15s.

2315: "Specifications for Standard Dimensions of Three-phase Motors for Intermittent Service in Iron and Steel Works." H. SCHÖNIG. Stahl Eisen, 1956, 76, Oct. 4, 1290-1292. £2.

2020: "The Manufacture of Partly Chilled Rolls from Spheroidal Graphite Cast Iron." R. D. RUSIEW. Prz. Odlew., 1960, 10 (4), 106-111. £4 5s.

2049: "Forward Flow and Coefficient of Friction in Rolling." T. M. GOLUBEV and M. A. ZAIKOV. Issledovanie protsessov obrabotki metallov davleniem. Vypusk 1. (Research on processes of metal working by pressure, issue No. 1). Trudy Sibirskogo metallurgicheskogo instituta im. S. Ordzhonikidze, Sverdlovsk, Metallurgizdat, 1954, 69-121. £7 10s.

2121: "Plastic Strain and Fracture of Steel Specimens Subjected to a Cylindrical State of Stress. Application to the Study of the Hydrogen Embrittlement of Steel" (with discussion). K. LIANG, *et al.* Rév. Mét. Mém. Sci., 1960, 57, Mar. 203-214. £5 5s.

2163: "The Extrusion of Steel Tubes and Sections." E. K. L. HAFFNER and R. M. L. ELKAN. Neue Hütte, 1960, 5, May, 266-278. £5 15s.

2166: "The Determination of Nitrogen in Steel, Iron, and Ferro-alloys." J. CALMETTES and H. GUINOT. Rev. Mét., 1960, 57, Oct., 925-933. £3 15s.

2190: "The Effect of Copper on the Corrosion Behaviour and Mechanical Properties of Austenitic Chrome-nickel Steels." T. RAMCHANDRAN, *et al.* Arch. Eisenhüt., 1961, 32, Mar., 173-185. £8 5s.

2167: "Analysis of Hydrogen, Oxygen, and Nitrogen in Metals Under Reducing Conditions in Argon." J. HANCART and J. MAROT. Rev. Mét., 1960, 57, Oct., 911-917. £4 5s.

2221: "Progress in the Field of Electrical Sheets." H. HESSELBACH. Technica, 1959, Nov. 20, 1333-1338. £4 15s.

2258: "Symbols, Classification, and Quality Standardization for Submerged Arc Welding Powders." G. BECKER. Schweisstechnik, 1960, 10 (5), 175-178. £3.

2272: "The Importance of Edging Passes in the Rolling of Blooms." W. LESKIEWICZ. Hutnik (Poland), 1958, 25 (10), 386-390. £4 10s.

2280: "New Knowledge of Pickling with Phosphoric Acid and the Treatment of Waste Water." R. MORAN. Metall-Rein. Vorbeh., 1960, 9, May, 69-71. £2 10s.

2299: "Automatic Submerged Arc Welding of Thin-walled Pipes of Small Diameter." J. SVERCL and S. VYSOUZIL. Zváranie (Bratislava), 1960, June, 177-178. £2 5s.

2305: "Properties of Rustless, Austenitic Chromium-nickel Steels Containing Boron for Nuclear Reactor Construction." K. BUNGARDT and R. OPPENHEIM. Arch. Eisenhüt., 1961, 32, Feb., 95-101. £3 15s.

2316: "Increasing the Erosion Strength of Steel for Steam-turbine Blades by Spark-hardening." M. G. TIMERBULATOV and V. P. SAVUKOV. Energomash., 1961, 7, Apr., 32-34, 40. £3 10s.

2337: "Jalousie-type Dust Catchers for Gas Cleaning." V. D. KANFER and M. S. SHKLYAR. Metallurg, 1961, 6, Mar. £1 10s.

2338: "Magnetic Roasting of Iron Ores. (In Countries who are Members of the SEV (the East European Council for Mutual Economic Aid))." G. V. GUBIN. Metallurg, 1961, 6, Mar. £2 15s.

2349: "Mathematical Investigation of the Drawing Process." E. SIEBEL. Stahl Eisen, 1952, 72, Apr. 10, 425-426. 15s.

Stock Chain Drives

Extension to its range of chain drives from stock, making available a total of 260 different drives up to 140 h.p., is announced by Renold Chains, Limited, Wythenshawe, Manchester. The new series of drives utilizes the 0.625 in. pitch simple roller chain and provides a step between the 0.50 in. pitch simple and 0.75 in. pitch simple chain drives. Since approximately 40 per cent. of the field previously calling for 0.75 in. pitch chain is now covered by the new drives, it will be possible in many cases to effect savings in cost and space.

New Patents

PATENTS below are among the complete specifications accepted listed in the Official Journal (Patents). The numbers given are those under which the specifications have been printed and all subsequent proceedings will be taken.

Applications for copies of the full specifications (3s. 6d. each, post free) should be made to the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C.2.

Mining and Mining Appliances

869,868 EICKHOFF, MASCHINENFABRIK UND EISENGIESSEREI GEB. Space-clearing appartus for mining machines for mines.
870,313 MASCHINENFABRIK UND EISENGIESSEREI A. BEIEN. Coal breaker for underground mining.
870,075 MINE SAFETY APPLIANCES COMPANY. Dust collectors for drills.
870,426 SIEMENS-SCHUCKERTWERKE A.G. Motor for a coal-winning machine.
870,495 AUSTIN HOY & COMPANY, LIMITED. Coal-cutter chains.
870,486 DOWTY MINING EQUIPMENT, LIMITED. Pushing devices for shifting mining machinery.
870,502 DOWTY MINING EQUIPMENT, LIMITED. Breather valve arrangements for hydraulic props.
870,379 WESTFALIA DINNENDAHL GRÖPPEL, A.G. Separating shale from raw broken mined coal.
870,074 MINE SAFETY APPLIANCES COMPANY. Dust collecting head.
870,507 QUALTER, HALL & COMPANY (SALES), LIMITED. Hinged bridging platforms for pit cages.
869,836 MINING ENGINEERING COMPANY, LIMITED. Belt conveyors.
870,514 BECORIT GRUBENAUSBAU, G.M.B.H. Hydraulic pitprops.
870,655 MASTABAR MINING EQUIPMENT COMPANY, LIMITED. Hydraulic roof supports.
870,892 K. M. GROETSCHEL. Tool head and tool for mining work.
871,054 F. W. PAURAT. Mine arches.
871,055 F. W. PAURAT. Hinged shoring arch for mines.
871,015 MAVOR & COULSON, LIMITED. Tandem driving drum assemblies for belt conveyors.
870,858 GEWERKSCHAFT EISENHÜTTE WESTFALIA. Intermediate drive for conveyors having adjacent conveying and return runs.
870,818 MINING ENGINEERING COMPANY, LIMITED. Conveying and storage system for use in coal mines.
871,204 DEMAG, A.G. Wagon tippler.
871,810 TUBEWRIGHTS, LIMITED. Mine roof support structures.
871,662 QUALTER, HALL & COMPANY (SALES), LIMITED. Plant for handling mine cars.
871,374 F. SCHMID. Mine roof supports.

Metallurgy and Engineering

869,656 VITKOVICKE ZELEZARMY KLEMENTA GOTTWALDA, NARODNI PODNIK. Open-hearth furnaces.
869,690 UNIVERSAL-CYCLOPS STEEL CORPORATION. Austenitic steel alloys.
869,802 CENTRE NATIONAL DE RECHERCHES METALLURGIQUES, and ACIERIES REUNIES DE BURBACH-EICH-DUDELANGE, S.A. Steel manufacture.
869,935 PHILCO CORPORATION. Cold-working of metals.
869,953 RUHRSTAHL, A.G. Refining of steel.
870,014 R. H. and J. F. GOVAN. Control and removal of slag deposits in furnaces.
870,212 and 870,213 GENERAL ELECTRIC COMPANY, LIMITED. Casting grain-oriented ingots.
870,162 BRITISH IRON AND STEEL RESEARCH ASSOCIATION. Purification of metals.
870,184 HÜTTENWERK OBERHAUSEN, A.G. Refining of steel by the pneumatic process.
870,223 OSTERREICHISCH-AMERIKANISCHE MAGNESIT, A.G. Furnace roof for melting furnaces, particularly for tiltable open-hearth furnaces.
870,227 DEUTSCHE GOLD- UND SILBER-SCHEIDEANSTALT. Chill mould for high vacuum arc furnaces.
870,342 PROLER STEEL CORPORATION. Scrap refining process and product.
870,668 FOUNDRY SERVICES INTERNATIONAL, LIMITED. Production of metal castings and ingots.
870,556 WISTRA OFENBAU, G.M.B.H. Continuous heat treatment of elongated iron or steel articles.
870,565 KLÖCKNER-HÜTTENWERKE HASPE, A.G. Method of refining pig-iron.
871,088 D. J. HIGGS. Guards for two-roll mills.
871,167 TIMKEN ROLLER BEARING COMPANY, LIMITED. Graphitic steel.
871,005 FRIEDRICH KOCKS, G.M.B.H. Rolling iron wire.
871,127 MOLYBDENUM CORPORATION OF AMERICA. Production of iron or steel alloys.
870,954 WEAN EQUIPMENT CORPORATION. Shearing continuously advancing strip.
871,210 ARBED, ACIERIES REUNIES DE BURBACH-EICH-DUDELANGE S.A. Steel manufacture.
870,777 UNITED ENGINEERING & FOUNDRY COMPANY. Rolling strip material.
870,750 MANNESMANN, A.G. Piercing solid metal ingots.
871,667 FOSECO INTERNATIONAL, LIMITED. Deoxidation of iron and steel.
871,360 SCHLOEMANN, A.G. Rolling-mill trains for the two-line rolling of fine iron and wire.
871,404 INNOCENTI SOC. GEN. PER L'INDUSTRIA METALLURGICA E MECCANICA. Device for preventing access of water to gearboxes and bearings of rolling-mill cages.
871,659 ALLMÄNNA SVENSKA ELEKTRISKA. Degasifying molten metal.
871,715 R. J. FLETCHER. Arc furnace for melting reactive refractory metals.

Fuel Treatment and Utilization

871,026 SCHÜCHTERMANN & KREMER-BAUM (AKTIENGESELLSCHAFT FÜR AUFBEREITUNG. Charging coke-oven chambers with coal.
870,041 UNION CARBIDE CORPORATION. Treatment of hydrocarbon mixtures derived from coal.
870,464 C. M. LOCHRIE. Production of readily combustible packages from screened residues of solid fuel.

Use of Television When Drilling

An apparatus recently perfected in the USSR makes it possible for rock sequences in well boreholes to be inspected directly by a television camera which is combined with a lighting system and photographic camera in a tube just over 2 in. dia. and 5 ft. long. The pictures are displayed on a screen in the control panel at the well-head, from which colour photographs can be taken as required.

Accidents at Mines

REPORT OF HM CHIEF INSPECTOR FOR 1960

There were 317 deaths from mine accidents in 1960, compared with 348 in 1959. The number seriously injured fell from 1,676 to 1,573. The 1959 figures included 47 men killed at Auchengeich Colliery (Lanarkshire) and those for 1960 included 45 men killed at Six Bells Colliery (Monmouthshire). There was thus a reduction of 31 persons killed and 103 seriously injured. But HM Chief Inspector of Mines points out that fewer manshifts were worked in 1960, and that in fact no improvement can be recorded.

THE report for 1960 of HM Chief Inspector of Mines and Quarries (Mr. T. A. Rogers) has been published by the Ministry of Power. Copies can be obtained from the Stationery Office, price 4s. net.

Mr. Rogers says that although the accident figures (Table 1) show a reduction of 31 persons killed and 103 persons seriously injured, the number of manshifts worked in coal mines in 1960 was appreciably less than those worked in 1959, and in fact there was no improvement whatsoever in the rate for persons killed, and, indeed, a deterioration in the rate for persons seriously injured. The best indication of the incidence of accidents is the rate per 100,000 manshifts (Table 2).

Falls of ground in 1960 resulted in 124 men being killed and 639 seriously injured. The number killed was less than any previously recorded, and the number seriously injured, though not the lowest recorded, was considerably less than in 1959. Mr. Rogers has the impression that, on the whole, accidents are occurring less frequently in places where conditions are normal; it may be that the roofs are now being more closely and better supported regardless of their appearance, he says. Accidents still continue to occur, however, with roughly the same frequency where there is a greater measure of hazard, in particular where supports are being disturbed, near longwall roadheads and the waste edges. Accidents still too frequently occur on the face side of the conveyors in prop-free fronts and near existing cavities on faces and at roadheads.

With the further extension of power-loading, the average size of the supported excavations at roadheads and stables continues to increase. The lengths of stables should be kept to a minimum, and anything that can be done to lessen the distances between the roadside packs and the face opposite would be a distinct advantage. Especially, where faces advance rapidly there is need for close co-ordination of the operations in the stable to keep the pack-to-face distance to a minimum. The area of roof over the drivehead, which cannot be directly supported, may reach 100 sq. ft. during the advancing operations; the use of hydraulic motors might well be a means of greatly reducing this area, and their development should be pressed forward.

When the ripping is outbye of the driveheads—the most common situation—the character and arrangement of the main roof bars are of the first importance. Broad light-alloy girders have had considerable advantages as roadhead supports, and their replacement by steel girders, because of the incendive sparking hazard, has led to difficulties. It now appears, however, that the twin-web bars designed by the Safety in Mines Research Establishment have passed underground trials successfully. These girders have an additional advantage

TABLE 1.—*Accidents at Coal Mines in* 1960 *and* 1959.

Categories.	Killed.		Seriously injured.	
	1960.	1959.	1960.	1959.
Falls of ground:				
(*a*) at the face	108	130	593	644
(*b*) on roads	16	12	46	66
Haulage and transport ..	69	75	437	482
Gases, coal dust, and fires:				
(*a*) explosions	49	16	8	5
(*b*) others	1	52	2	6
Machinery	14	12	67	83
By explosives	6	6	25	25
Other underground	14	9	191	171
In shafts	10	14	17	20
Surface	30	22	187	174
Total	317	348	1,573	1,676

TABLE 2.—*Accidents in Relation to Manshifts.*

Year.	Rates per 100,000 manshifts.		
	Killed.	Reportably/ seriously injured.*	Total.
1946	0.30	1.28	1.58
1947	0.34	1.36	1.70
1948	0.25	1.29	1.54
1949	0.25	1.20	1.45
1950	0.27	1.13	1.40
1951	0.27	1.07	1.34
1952	0.23	1.13	1.36
1953	0.21	1.07	1.28
1954	0.20	1.03	1.23
1955	0.24	1.06	1.30
1956	0.19	1.00	1.19
1957	0.23	1.09	1.32
1958	0.20	1.06	1.26
1959	0.23	1.10	1.33
1960	0.23	1.12	1.35

* Reportably injured 1946-1957, seriously injured 1958/1960.

over the forms of steel girder in general use, in that they are able, when deflected considerably under load, to recover when unloaded.

Experience, particularly in the East Midlands, has shown the desirability in general of setting the main roof bars at right angles to the face. The nature of the supports set beneath the bars is of first importance. In the Chief Inspector's opinion, supports which must be disturbed to make way for machinery should be of a type that can be pre-loaded. Some progress is being made in the methods of support of roadheads inbye of the ripping, but, in his view, methods of support outbye of the ripping have shown little or no improvement in recent years and much work remains to be done in this connection. Many large cavities start to form at or just outbye of the ripping; if a small fall occurs before effective supports are set to the newly exposed roof it may, in the course of two or three advances, develop into a large and uncontrollable cavity in which firedamp may accumulate in dangerous quantities.

Danger at Waste Edge

Twenty-one persons were killed while working near longwall waste edges. Eighteen of the fatalities occurred on faces on which strip packs were built, 12 of these during the withdrawal of supports from the waste. One occurred where pneumatic stowing was done and two on caved faces. As the percentage of longwall faces on which caving is practised is now about 30, the figures confirm Mr. Rogers's view that withdrawal of supports on strip packed faces is less safe than where complete caving is practised. He emphasizes the need for more systematic withdrawal in strip-packing operations, and in particular that persons should not have to return to a partly drawn-off waste edge.

Exemptions from the regulations permitting the operation of prop-free-front faces almost always include a condition that persons crossing the conveyor shall set temporary props for their protection. Where the coal is pre-cut, protection from falls of coal is also necessary. These precautions must be taken even if, as is usually the case, persons are in front of the conveyor only for a short time. Mr. Rogers stresses that the proper way to tackle this problem is to avoid the need for persons to cross the conveyor rather than to set supports to protect them when they are obliged to cross it.

The main reason why persons cross the conveyor is to load on to it coal left by a shearer-loader or trepanner, or coal which has fallen from the face or off the conveyor after the passage of the machine. If coal falls from the face before the conveyor can be moved up, the coal may be too soft for the type of machine being used and a coal plough might suit the conditions better. Pre-cutting weakens the coal and more may fall off the face; for this and other reasons pre-cutting should not be done more widely nor to a greater depth than is necessary: the less the depth of the pre-cut the less will be the amount of debris made in cutting. A pre-cut at or near floor level is generally adopted with a trepanner and, indeed, is considered necessary to stabilize the machine, but there is ample experience to show that the machine can be adequately stabilized by a pre-cut only 15 in. deep, the Chief Inspector asserts.

Steps can often be taken to minimize the amount of coal being left by the machine. Shearer-loaders fitted with a new type of drum having a spiral action are being used successfully. The amount of coal left behind a trepanner has been reduced by fitting a rubber tipped plate between the side of the machine and the face and an angled guide on the top of the machine to direct the coal accumulating at the plate towards the conveyor.

For loading such coal as nevertheless collects on the floor behind the power-loader, scavenger ploughs may be used. Mr. Rogers appreciates that in the past a number of managements have worked hard on this problem without complete success. But lately the management of Langton Colliery, Nottinghamshire, has devised a simple type of plough, for fitting behind a trepanner, which can be easily changed from end to end of the machine in the stable. Attempts are being made in the East Midlands to adapt the plough to a shearer-loader.

Mr. Rogers is pleased to report that some progress is being made in dealing with this obvious weakness in the operation of prop-free fronts, and he hopes that by the end of 1961 the problem will largely have been solved.

Six men were killed and 25 seriously injured in accidents involving the use of explosives or blasting devices, exactly the same numbers as those for 1959. Additionally, 236 persons were reported as having received minor injuries as a result of certain "dangerous occurrences" compared with 265 in 1959. These figures are particularly disappointing to Mr. Rogers as they show no significant improvement in a year when the output and manpower at mines diminished. For several years it has been necessary to record that the large majority of accidents had been caused by contraventions of the Coal Mines (Explosives) Regulations, 1956, usually on the part of the shotfirer, and 1960 is no exception. With all the exhortation in inspectors' annual reports and the efforts on the part of the National Coal Board to train the shotfirers in proper methods, one would have expected at least some improvement, Mr. Rogers remarked.

Unsatisfactory Stemming Practice

During the last few years a method of providing stemming has been developed which is not, in the Chief Inspector's opinion, entirely satisfactory. This method is to provide stemming bags of fireproofed paper intended to be filled with sand or stone dust underground, but this gives rise to the danger that these bags may be filled with other than inert material. It seems to Mr. Rogers that it would be better to prepare stemming on the surface and send it below ground in a form which those who use it may recognize.

Work on the development of safer explosives and detonators for use in the delay action firing of rippings has continued. These "ultra-safe" explosives are, as would be expected, weaker in

their action than the usual types of permitted explosive and it has been found necessary to use heavier charges or bore more holes in a round. Mr. Rogers hopes that managements will not be deterred by these apparent disadvantages from considering seriously the possibilities of using this type of explosive more extensively; its less incendive characteristics should be adequate compensation.

In a section in his report on explosions, the Chief Inspector records that the year was marred by an explosion of firedamp and coal dust at Six Bells Colliery, when 45 persons were killed. This was the worst explosion in South Wales, except for that which occurred at Marine Colliery in 1927, since the Senghenydd disaster in 1913. A public inquiry was held.

The outstanding feature of the other ignitions was the large number, 12, or 50 per cent. of the total, which were caused by frictional sparking during orthodox coal-cutting operations. The main factor predisposing the occurrence of these ignitions is the presence near the cutting horizon of a band of hard material or of intrusions of quartzitic sandstone, particularly when such a band or intrusion wanders in a vertical plane in relation to the seam. Having selected an appropriate cutting level clear of such stone, the next precautionary step to take is to ensure that cutting is done wet and that the water is directed right to the back of the holing, where the picks actually strike. Managements must ensure that fire fighting arrangements are always maintained at a high standard; this means that hydrants must be kept close up to the face, suitable hose pipes must be provided and an ample water supply must always be available. Portable fire extinguishers must be carried on the cutting machine, or supplies of dust or sand provided at suitable intervals on the face and at intake roadheads.

"Close Collaboration" at Cardowan

Ignitions of firedamp in a machine undercut are always difficult to suppress. The work exposes the fire-fighters to considerable danger because of the possibility of ignition of larger accumulations of firedamp. Unless the fire can be put out quickly it may be necessary to seal off the district and, in some cases, to reopen it again—both potentially dangerous operations. Such a situation occurred at Cardowan Colliery in Scotland in the early part of the year. In addition to the large quantities of firedamp which had to be cleared from the district, the reopening was made unusually difficult because two concreted stoppings had to be removed. These stoppings were ingeniously flooded and successfully and safely blasted out by shots fired from the surface. In the subsequent operations, however, despite the close collaboration at all stages of all interested parties, including HM Inspectors, four persons were killed by an explosion.

It is signfiicant that the 12 ignitions during the year occurred at only eight collieries, the report states. A promising attack on this problem has been made by an inspector in Scotland who, with the help of the National Coal Board management and engineers, has devised an apparatus for ventilating the undercut so that the amount of gas present is always well below the inflammable range. Although primarily designed for compressed air machines, it is likely that the device could be adapted and used with machines driven by electrictiy. A "water ejector" intended to serve the same purpose is being developed by an inspector in the Durham Division.

Referring to belt conveyor fires, HM Chief Inspector selects one incident as worthy of particular mention. On descending the upcast shaft at the commencement of a weekend shift an official smelt smoke which he traced to a loader gate some two miles from the shaft bottom. In the loader gate he found small coal and dust on fire beneath the gate belt conveyor. Considerable quantities of fine coal dust had been allowed to accumulate around the bottom rollers; the friction of the bottom belt probably heated the dust to its ignition temperature. The important feature about this fire, which took three hours to extinguish, is that the conveyor had not been running for 27 hours, and during the whole of this time the coal dust had smouldered unnoticed before finally bursting into open flame. It is very fortunate that the fire was detected in its early stage before it reached uncontrollable proportions. Had fire-resistant belting not been used in this case the fire would almost certainly have been out of control long before it was discovered, Mr. Rogers remarks.

Need for "Great Care"

In previous reports the Chief Inspector has stressed the growing hazards associated with machine stables at the ends of power-loaded faces. The increase in the number of power-operated face supports has been accompanied by an increase in the amount of open-caving. The influence of open-caving on the firedamp yield both in the general body of the air and, where firedamp drainage is practised, in the firedamp range, is still being studied. It is evident, however, that open-caving results in greater accumulation of firedamp at the return end of the waste adjacent to the roadside pack and that, where special measures are not taken to remove the firedamp, there is a heavier discharge of firedamp from the waste into the air stream at this point. Quite often machine stables at the return end of the face are ventilated by means of brattice cloths run from the gateside pack across the conveyor, thus directing the air stream into the stable. It is clear that great care is necessary in these circumstances because there is a danger of directing firedamp-laden air from the waste into the stable. In these conditions the installation of a water air-injector might be considered.

Where open-caving is practised it is very necessary to have systematic methanometer surveys made to establish the firedamp content of the waste, particularly at the return end. When accumulations of firedamp are found they should be re-

moved either by firedamp drainage boreholes or by the leaving of "cundies" through the return gateside pack.

The introduction of power-loading and the subsequent concentration of output has meant that longwall faces are now quite often advancing at the rate of 8 ft. to 10 ft. in 24 hr. This higher rate of advance has, in some cases, so increased the rate of emission of firedamp that firedamp drainage has had to be introduced. The heavier emissions have increased the difficulty of keeping ripping lips free from firedamp in spite of increased air quantities. In one case, where there were two ripping lips within 15 yd. of a longwall face, firedamp was present at both lips until a firedamp drainage hole was bored over them at an angle of 30 deg. to the horizontal; such holes are now systematically bored at intervals of 15 yd. There can be no doubt that this kind of situation will multiply as higher rates of face advance are attained, and there is wide scope for the introduction of local firedamp drainage in such circumstances.

Managements may be faced with difficult decisions should a fire occur underground where firedamp drainage has been installed. Mr. Rogers recommends managements to consider and decide now what should be done in such circumstances rather than wait until they are confronted with a fire.

Among the considerations they should bear in mind are whether the drainage should continue while the fire is being fought, whether drainage should continue if stoppings have to be built, whether the main drainage pipe should be left intact and built into the stopping or whether it should be disconnected on the inbye side of the stopping, and whether or not pipe ranges, if undulating, will become blocked with water.

Mr. Rogers would like to see many more automatic water sprays installed over conveyors. On dust prevention generally, he says that water infusion is often the most effective prevention measure, because it wets the coal before it is worked and thereby prevents dust becoming airborne. For this reason he regrets the further reduction in the amount of water infusion practised in most divisions because other treatments, such as the use of external water sprays, aim at suppressing the dust after it has become airborne.

During 1960, 69 persons were killed and 437 were seriously injured in haulage and transport accidents; the total number of casualties is the lowest ever recorded in this category. A more detailed study of the circumstances of these accidents, however, reveals that there is little reason for complacency. Very little, if anything, constructive appears to have been done to make haulage operations safer, Mr. Rogers says.

There have been a number of manriding accidents during the year. Specially constructed manriding carriages equipped with emergency brakes are being introduced quite extensively, but much remains to be done if the use of mineral tubs and mine cars for the transport of men is to be eliminated. Even specially made manriding trains must be properly maintained if they are not to deteriorate and become dangerous. This implies the need for properly constructed, drained, and well-illuminated inspection pits and other facilities that make for good maintenance, as well as the employment of properly trained staff working under adequate supervision. The provision of satisfactory track lay-outs and their maintenance should also claim the attention of managements. Difficulties, such as the provision of sufficient standing room for manriding trains not in use, can generally be overcome given the will to do so.

Inspection at some mines has revealed a poor standard of examination, testing, and maintenance of diesel locomotives. Inlet and exhaust systems of engines should be given particular attention, otherwise there is a grave danger that excessive amounts of toxic gases may escape through slack joints. Managements may find that it is necessary to seek specialist advice to ensure that excessive amounts of oxides of nitrogen and carbon monoxide are not discharged in the exhaust gases.

Investigation has revealed some deficiencies in the overwind protection of a number of winding engines where the maximum speed of winding cannot exceed 12 ft./sec.; in such cases the provision of an automatic contrivance to prevent overwinding is not a statutory requirement. On some winders the safety devices and brakes have been found to be inadequate to prevent danger to persons should the winding engineman for any reason lose control. Many of these engines may be used only infrequently for the transport of small numbers of persons, but it is essential that suitable safety standards be established. In the meantime, managements should review the standards of safety on their installations and take steps to improve the conditions should it be found necessary. These might include the limitation of the maximum winding speed and the provision of overtravel devices.

TWO JAPANESE FIRMS, Yawata Steel Works and Mitsubishi Shoji, are reported to be negotiating for the rebuilding of the Chilean ports of Puerto Montt and Valdivia, which were destroyed in last year's earthquakes. The Japanese proposals provide for the services of engineers and technicians as well as the supply of materials. The new port works would be constructed to withstand earthquakes, and would require some 25,000 tons of steel.

IRON-ORE OUTPUT in West Germany in June fell to 1,595,928 tons in 24.7 working days, compared with 1,638,438 tons (24 working days) in May. Daily average fell from 68,268 tons to 64,612 tons. Over the first half of this year, iron-ore output was 9,518,636 tons, against 9,370,928 tons in January-June, 1960. West German output of finished steel products in June totalled 1,835,174 tons in 24 working days, against 1,840,142 tons in May (24.5 working days). Daily average rose from 75,108 tons to 76,466 tons. In the first half of the year, production rose to 11,258,666 tons, compared with 11,093,529 tons in the corresponding period of last year—an increase of 1.5 per cent.

NEW METHOD OF HANDLING LIME *in* Electric Furnace Melting Shop

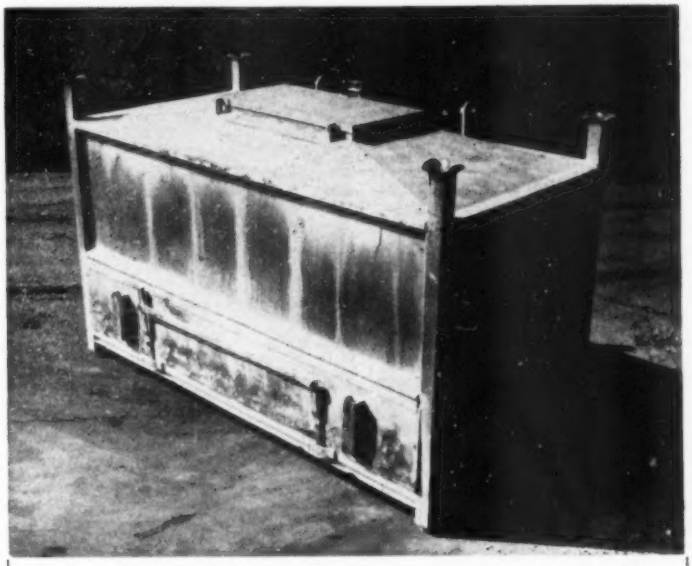


FIG. 1.—CLOSE-UP VIEW OF THE CONTAINER FOR LIME.

A NEW lime-handling system featuring a simple waterproof metal container has been proved to have several advantages to the steel and tube division of the Timken Roller Bearing Company at Canton, Ohio. Used to haul and store lime needed daily by the melting shop, the containers eliminate the problem of lime absorbing a high percentage of moisture before being used. The hydrogen in the moisture is an undesirable factor for making quality steel. In addition, the fresh, uniform quality of the lime transported in daily minimizes the most critical problem of slag control. With the new system there is now positive control of the lime coming into the plant, an improved inventory position, and a reduction in handling costs.

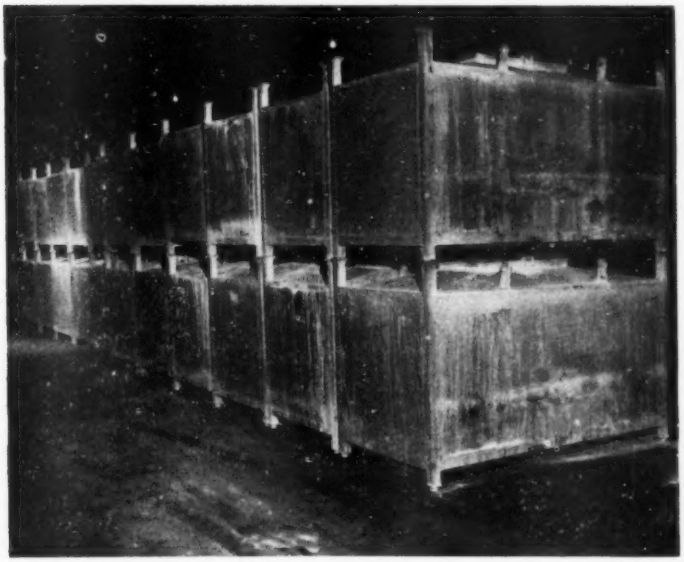


FIG. 2.—CONTAINERS STACKED ONE ON TOP OF ANOTHER.

When operating at full capacity, the company's nine electric furnaces require about 100,000 lb. of lime daily. Formerly, to fill this need, lime was bought in wagon-load lots. The lime either was dumped directly into charging boxes or piled into shallow containers on the charging floor. This open storage method permitted the lime to absorb moisture. An emergency supply was stored in a large bin. Often lime arrived several wagons at a time, thereby intensifying the problem.

The metal containers are

moved either by firedamp drainage boreholes or by the leaving of "cundies" through the return gateside pack.

The introduction of power-loading and the subsequent concentration of output has meant that longwall faces are now quite often advancing at the rate of 8 ft. to 10 ft. in 24 hr. This higher rate of advance has, in some cases, so increased the rate of emission of firedamp that firedamp drainage has had to be introduced. The heavier emissions have increased the difficulty of keeping ripping lips free from firedamp in spite of increased air quantities. In one case, where there were two ripping lips within 15 yd. of a longwall face, firedamp was present at both lips until a firedamp drainage hole was bored over them at an angle of 30 deg. to the horizontal; such holes are now systematically bored at intervals of 15 yd. There can be no doubt that this kind of situation will multiply as higher rates of face advance are attained, and there is wide scope for the introduction of local firedamp drainage in such circumstances.

Managements may be faced with difficult decisions should a fire occur underground where firedamp drainage has been installed. Mr. Rogers recommends managements to consider and decide now what should be done in such circumstances rather than wait until they are confronted with a fire.

Among the considerations they should bear in mind are whether the drainage should continue while the fire is being fought, whether drainage should continue if stoppings have to be built, whether the main drainage pipe should be left intact and built into the stopping or whether it should be disconnected on the inbye side of the stopping, and whether or not pipe ranges, if undulating, will become blocked with water.

Mr. Rogers would like to see many more automatic water sprays installed over conveyors. On dust prevention generally, he says that water infusion is often the most effective prevention measure, because it wets the coal before it is worked and thereby prevents dust becoming airborne. For this reason he regrets the further reduction in the amount of water infusion practised in most divisions because other treatments, such as the use of external water sprays, aim at suppressing the dust after it has become airborne.

During 1960, 69 persons were killed and 437 were seriously injured in haulage and transport accidents; the total number of casualties is the lowest ever recorded in this category. A more detailed study of the circumstances of these accidents, however, reveals that there is little reason for complacency. Very little, if anything, constructive appears to have been done to make haulage operations safer, Mr. Rogers says.

There have been a number of manriding accidents during the year. Specially constructed manriding carriages equipped with emergency brakes are being introduced quite extensively, but much remains to be done if the use of mineral tubs and mine cars for the transport of men is to be eliminated. Even specially made manriding trains must be properly maintained if they are not to deteriorate and become dangerous. This implies the need for properly constructed, drained, and well-illuminated inspection pits and other facilities that make for good maintenance, as well as the employment of properly trained staff working under adequate supervision. The provision of satisfactory track lay-outs and their maintenance should also claim the attention of managements. Difficulties, such as the provision of sufficient standing room for manriding trains not in use, can generally be overcome given the will to do so.

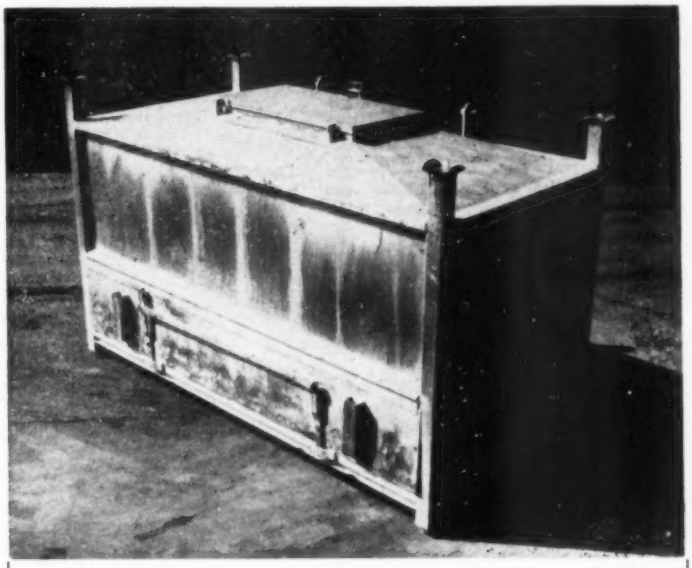
Inspection at some mines has revealed a poor standard of examination, testing, and maintenance of diesel locomotives. Inlet and exhaust systems of engines should be given particular attention, otherwise there is a grave danger that excessive amounts of toxic gases may escape through slack joints. Managements may find that it is necessary to seek specialist advice to ensure that excessive amounts of oxides of nitrogen and carbon monoxide are not discharged in the exhaust gases.

Investigation has revealed some deficiencies in the overwind protection of a number of winding engines where the maximum speed of winding cannot exceed 12 ft./sec.; in such cases the provision of an automatic contrivance to prevent overwinding is not a statutory requirement. On some winders the safety devices and brakes have been found to be inadequate to prevent danger to persons should the winding engineman for any reason lose control. Many of these engines may be used only infrequently for the transport of small numbers of persons, but it is essential that suitable safety standards be established. In the meantime, managements should review the standards of safety on their installations and take steps to improve the conditions should it be found necessary. These might include the limitation of the maximum winding speed and the provision of overtravel devices.

TWO JAPANESE FIRMS, Yawata Steel Works and Mitsubishi Shoji, are reported to be negotiating for the rebuilding of the Chilean ports of Puerto Montt and Valdivia, which were destroyed in last year's earthquakes. The Japanese proposals provide for the services of engineers and technicians as well as the supply of materials. The new port works would be constructed to withstand earthquakes, and would require some 25,000 tons of steel.

IRON-ORE OUTPUT in West Germany in June fell to 1,595,928 tons in 24.7 working days, compared with 1,638,438 tons (24 working days) in May. Daily average fell from 68,268 tons to 64,612 tons. Over the first half of this year, iron-ore output was 9,518,636 tons, against 9,370,928 tons in January-June, 1960. West German output of finished steel products in June totalled 1,835,174 tons in 24 working days, against 1,840,142 tons in May (24.5 working days). Daily average rose from 75,108 tons to 76,466 tons. In the first half of the year, production rose to 11,258,666 tons, compared with 11,093,529 tons in the corresponding period of last year—an increase of 1.5 per cent.

NEW METHOD OF HANDLING LIME *in* Electric Furnace Melting Shop



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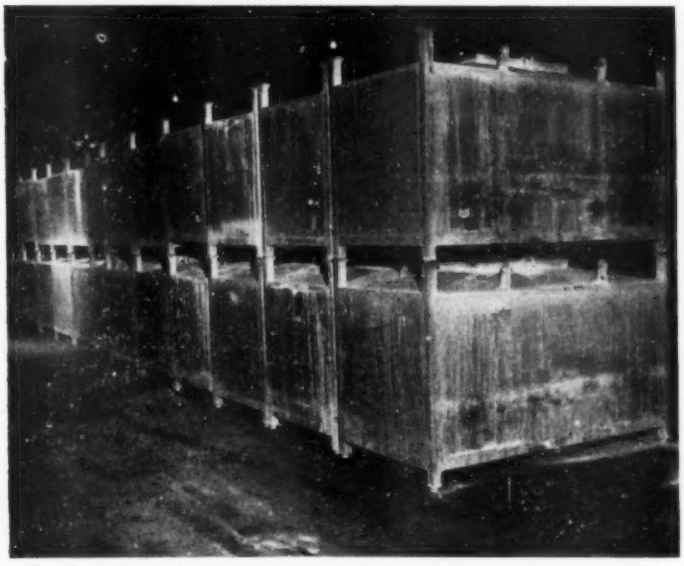

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The metal containers are

38 in. high, 40 in. wide, and 80 in. long. Dimensions of the container were carefully designed to hold enough lime to fill three charging boxes and to fit on the flat bed of a truck 10 at a time. The trap door at the bottom of the container releases the lime. Four flared pedestals at the top are 6 in. in length and permit containers to be stacked one on top of the other. Pins at top are used in dumping lime container.

The 10 containers are filled in place on the truck bed. Each load is about 34,000 lb. Daily requirement of the melt shop running at capacity is 100,000 lb. Two trucks, bought especially for this purpose, are used as needed to haul lime.

Two lift trucks can unload the 10 containers in about 10 min. Storage area for the lime containers is just 100 yd. away. Lime for the charge floor of the melt shop gets first priority, but is taken from the storage area rather than directly from the truck, to maintain consumption on a first-in, first-out basis.

The storage area is located directly beneath the charging floor of the melt shop. Containers, with their specially designed legs, stack easily and safely one on the other. Lime is stacked in bays by truck lots facilitating the first-in, first-out system. Normally the lime will be used within three days after arrival assuring the melt shop a fresh, uniform quality of lime.

Lime is taken to the floor by lift truck ramps as ordered by the melters, and can be obtained, literally, within minutes. Usually an 8-hr. supply is kept on hand in the charging boxes. Lime in the containers absorbs little moisture nor does it slake. In a test one container was exposed to the weather for three months with no deterioration of the lime.

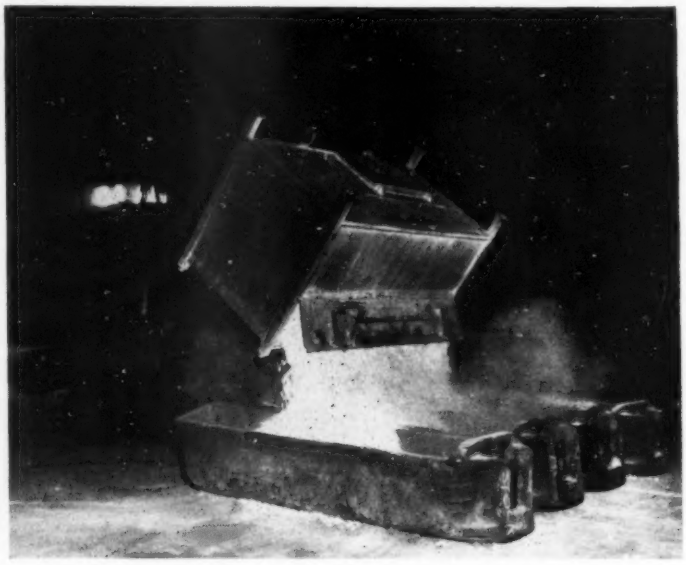


FIG. 3.—EMPTYING ONE CONTAINER INTO THREE CHARGING BOXES.

Using an adapter, the lift truck suspends the container over three charging boxes. A release to the trap door is tripped to spill the contents. Only lime needed for one shift will be on the floor at any one time, thus conserving space on the busy melting floor. Empty containers are returned to the storage area. Inventory control is very simple. Empty containers are loaded on the truck to be taken to source of supply for refilling. The lime requirement can be regulated to any level of melting operations.

Soviet Production During First Half-year

FIGURES published by the Central Bureau of Statistics of the Government of the USSR show that in almost every line of production the production targets have been reached, if not exceeded, during the first half of the present year, output being considerably above that during the first half of last year.

The gross output of industry during the first two and a half years of the current Seven-Year Plan is slightly above that during the whole period of the Five-Year Plan 1951-1955.

The following is a detailed breakdown of production in the first half of this year, the figures in parentheses being the increase compared with the corresponding period of 1960:—Pig-iron, 25,000,000 (109,000) tons; steel, 34,000,000 (109,000) tons; rolled-steel products, 27,200,000 (108,000) tons; steel tubes, 3,100,000 (110,000) tons; iron ore, 57,300,000 (111,000) tons; coal (including coking coal production of 55,500,000 (102,000) tons), 258,000,000 (99,000) tons.

FINSIDER GROUP OUTPUT

STEEL output in the Italian Finsider group in the year ended April 30 totalled 4,400,000 tons, representing a 24 per cent. increase. Pig-iron production increased by 28.8 per cent. to 2,270,000 tons following the putting into operation of the new blast furnaces in Bagnoli and Piombino. Rolled products output was up by 32.2 per cent. at 3,590,000 tons. Group exports were 540,000 tons, compared with 410,000 tons in the previous year.

Development projects on hand include the tube mill for the Taranto works, which will start production this autumn. Work has also started on a new plant in Novi Ligure, scheduled for completion in 1962.

DESPITE INCREASED PRODUCTION in South American and African countries, Canada maintained its position as the fifth-ranking copper producer in the world with a record output in 1960 of 438,383 tons. This exceeded the 1959 output by 43,114 tons.

SWEDISH MARKET FOR IRON AND STEEL

Will British Steel Be Squeezed Out?

Sweden was one of the five markets which last year bought more than £10,000,000 worth of British steel. But the Swedish industry, long famous for special steels, is now starting on commercial grades. Will British steel be squeezed out? This question is posed in the June issue of the British-Swedish Economic Review, published by the British-Swedish Chamber of Commerce, Hovslagargatan 5 B, Stockholm.

SWEDEN produces about one eighth as much steel as Britain; her output last year amounted to 1,500,000 tons of pig-iron and 3,250,000 tons of crude steel. There are about 30 iron and steel works and a further 15 wire and alloy manufacturers. They employ 50,000 people, or 5 per cent. of all industrial workers, and they account for 5½ per cent. of the total value of industrial manufacture and sales. One third of the output is exported, while imports run at about the same value as exports, though they are nearly twice as much as exports by weight.

Last year, iron and steel accounted for 7¼ per cent. of total Swedish trade as regards both imports and exports—£80,000,000 and £70,000,000, respectively. The value of exports is exactly doubled if the 20,000,000 tons of iron ore is added.

The British-Swedish Economic Review points out that the Swedish iron industry was based originally on charcoal and high-grade ore. In the 18th century, its 600 mills producing 60,000 to 80,000 tons a year accounted for over one third of all iron made in the world. Then came coke, and Britain's opportunity. Sweden has practically no coal deposits, and was forced to concentrate on special qualities and import commercial grades from Britain, Germany, and Belgium. Sweden continued for a long time to use charcoal: up to the 1914-18 war 85 per cent. of Swedish pig-iron was still coming from charcoal furnaces, though today the proportion is a dwindling 4 per cent.

Output Expansion

This pattern of importing quantity and exporting quality is one of the reasons why the Swedish iron and steel industry was, until recently, smaller than might be expected in relation to the country's total manufacturing capacity and reputation as a steel-making country. Between the wars development was frustrated by the depression of the 1920s and the intense foreign competition in the following decade, so that imports accounted for the great bulk of consumption.

In 1946, however, the first long-term co-ordination plan was drawn up—by Jernkontoret, the Swedish Ironmasters' Association. This envisaged new plant for making commercial steel, primarily for the home market, but also for export. Since 1950 production has increased at an annual rate of 7.8 per cent.—a rate which will be continued until 1965. During the past five years Swedish steel output has expanded by 50 per cent., which may be compared with 23 per cent. in the UK, 39 per cent. in the Common Market, and 44 per cent. in Russia. A further 50 per cent. increase is predicted between 1960 and 1965, raising capacity to 4,500,000 tons of ingot steel a year. Investment in iron and steel, which has averaged 400 mkr. in each of the last three years, is expected to average 330 mkr. over the next five years, and 250 mkr. between 1965 and 1970.

The expansion of the Swedish steel industry is one not merely of the size but also of the composition of production. During the 1950s output of special steel rose by 80 per cent., whereas output of commercial steel doubled. No immediate consequences have yet become apparent because of a more than corresponding increase in domestic consumption. In the 1960s, on the other hand, production will grow faster than domestic consumption.

The expansion will lead on the one hand to increased exports—in competition with British, continental, American, and Japanese steel. But most of the additional production, particularly as regards commercial qualities, will go to the Swedish home market, reducing the "import of quantity." Imports may well have reached their peak in 1960; this year they may be less than exports in value, and by 1965 less in weight as well. Sheets and plates, which account for over half of imports from Britain, will, of course, the article states, be among the products with which Swedes will very soon, at a bound, be largely able to supply themselves. The traditional Swedish practice of always maintaining an alternative supplier will still not be enough to prevent a reduction in imports of commercial grades of steel.

The Swedish market is sufficiently large and wealthy to justify a considerable export effort. Proximity to Britain, the absence of tariff barriers, and the ease with which English is understood in Sweden may perhaps turn the reader's thoughts towards the possibility of such an effort being made in fact. The slight tariff advantage for Britain resulting from the two countries' common member-

ship of Efta and the timing of the British Trade Fair in Stockholm in 1962 favour the making of such an effort now. Against this may be set the prospect that imports into Sweden are almost certain to diminish sharply during the 1960s, and that in the absence of unforeseen factors the British share of that falling market will itself fall. The main factors, discussed at length in the article, may be summarized as follow:—

(1) Expansion of domestic production in Sweden. But there are no formal restrictions on importing, and the Swedish buyer will certainly choose the best combination of price and quality offered to him, irrespective of its origin.

(2) British prices are high—higher by a bigger margin than any Efta tariff advantage can make up for. This is because:—(*a*) Britain's rigid price control system results in high prices when supplies are available and low prices when supplies are short; (*b*) freights are over twice as high from Britain as from the Continent, largely on account of port dues and labour costs; (*c*) open-hearth steel will soon no longer command a higher price than Bessemer steel made by new processes, and it must accordingly compete on price instead of on quality as hitherto.

(3) Standards—non-metric measurements effectively prevent sales of sections and bars.

(4) Stockholders, the biggest buyers, handle practically no British steel.

BEAMA Golden Jubilee Export Conference

EMPHASIS placed by electrical manufacturers on increasing their exports is reflected in the programme arranged by the British Electrical and Allied Manufacturers' Association for the BEAMA Golden Jubilee Export Conference to be held at the Connaught Rooms, London, W.C.2, on October 5 and 6. The President of the Board of Trade will speak at the conference luncheon, and on the first day there will be papers by leading authorities followed by discussions on electrical engineering and problems of trading with Europe and the western hemisphere.

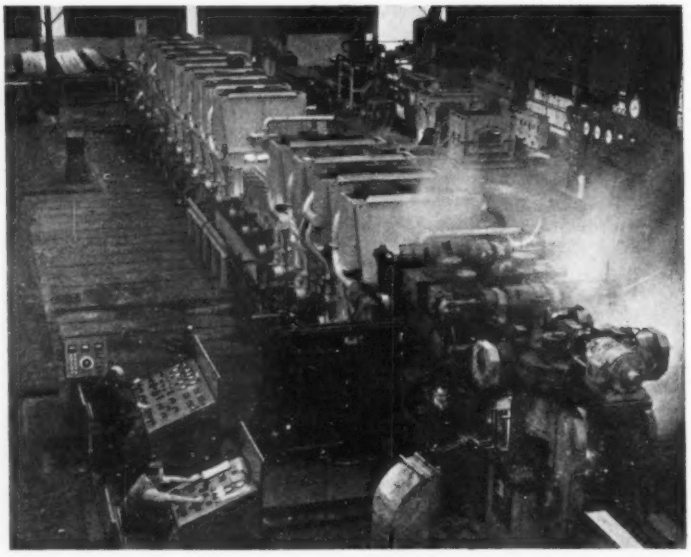
The session on the second day is reserved for a series of discussion groups on subjects of vital importance to all exporters.

Conference chairman will be Mr. Leonard Short, chairman designate of the BEAMA export panel and director of oversea operations of the English Electric Company, Limited.

FURNACE LINE CONVERTED WITHOUT PRODUCTION LOSS

THE high-speed heating line seen in the photograph works in conjunction with a Sendzimir planetary mill rolling stainless steel and high-carbon steel. Output has been increased from 9 to 15 ton/hr. by extending the furnace line and converting to distillate oil firing using Incandescent R.I.M.P.A. high-intensity burners.

The plant was installed by Incandescent at J. J. Habershon & Sons, Limited, Rotherham, in 1955 to heat steel slabs (maximum size 15 in. wide, 30 ft. long, 1¾ in. thick) in a single pass through the furnace. The slabs are then reduced to a strip 0.08 in. thick by the Planetary hot-rolling mill. Ten gas-fired furnaces sections were placed side by side so that the strip of metal would pass through them to be heated. Now an equalizing tunnel and four furnace sections have been added to the line.



INCANDESCENT HIGH-SPEED HEATING LINE FOR THE SENDZIMIR PLANETARY HOT-ROLLING MILL AT THE HOLMES MILLS, ROTHERHAM, OF J. J. HABERSHON & SONS, LIMITED.

Each section has its own blowing fan and built-in heat exchanger to preheat combustion air to 300 deg. C., making it entirely independent of the others. The sections are mounted on wheels so that any one can be moved out of the line, and replaced by a spare furnace, avoiding shutdown of the line during repair. The advantage of interchangeable units has been shown during extending and converting.

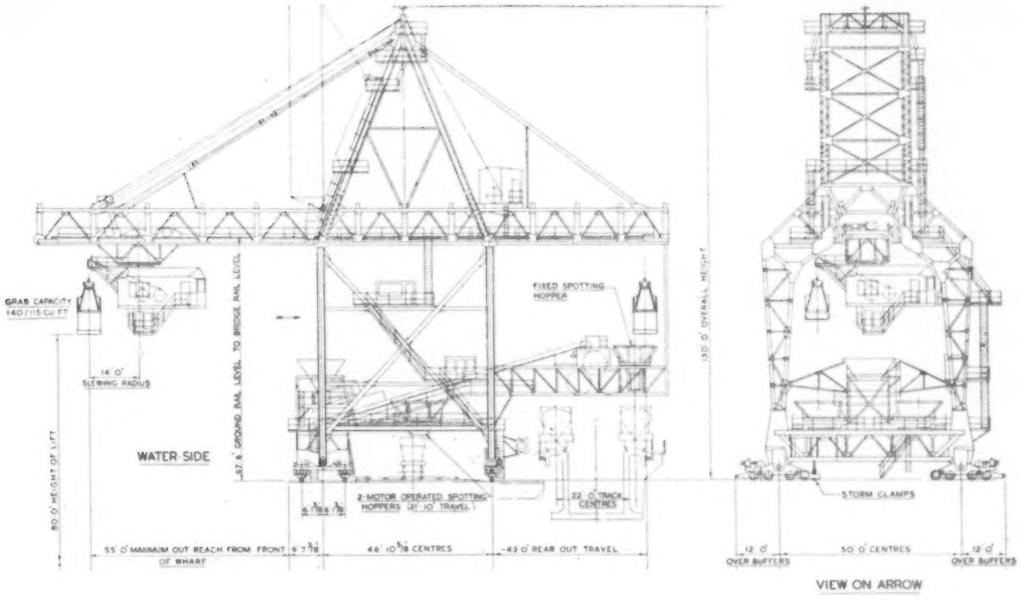

GRAB CAPACITY 140/115 CU FT
14' 0" SLEWING RADIUS
80' 0" HEIGHT OF LIFT
WATER SIDE
47' 6" GROUND RAIL LEVEL TO BRIDGE RAIL LEVEL
FIXED SPOTTING HOPPER
135' 0" OVERALL HEIGHT
2 MOTOR OPERATED SPOTTING HOPPERS (21' 10" TRAVEL)
22' 0" TRACK CENTRES
STORM CLAMPS
55' 0" MAXIMUM OUT REACH FROM FRONT OF WHARF
46' 10⅝" CENTRES
43' 0" REAR OUT TRAVEL
12' 0" OVER BUFFERS
50' 0" CENTRES
12' 0" OVER BUFFERS
VIEW ON ARROW

DIAGRAM SHOWING THE GENERAL ARRANGEMENTS OF THE ELECTRICALLY OPERATED TRAVELLING ORE UNLOADER AT THE CARGO FLEET IRONWORKS, SOUTH BANK, MIDDLESBROUGH, OF THE SOUTH DURHAM STEEL & IRON COMPANY, LIMITED.

Cargo Fleet's New Iron-ore Unloader

NOW in operation at the Cargo Fleet Ironworks, South Bank, Middlesbrough, is an electrically operated travelling ore unloader of 13½ tons gross capacity, recently supplied to the South Durham Steel & Iron Company, Limited, by the Wellman Smith Owen Engineering Corporation, Limited, Darlaston and London. Net capacity of the ore grab is 6 tons, and when handling ore having a density of 112 lb./cu. ft., an output of 400 ton/hr. is obtained.

The unloader, which was designed and constructed by Wellman Smith Owen, is carried on 28 wheels, 16 of them running on the waterside double-rail tracks. The reason for this track layout is that a maximum wheel load of 30/33 tons had not to be exceeded, in keeping with the carrying capacity of the wharf.

General arrangement of the machine is shown on the accompanying drawing and photograph. It is fitted with a waterside hinged boom giving clearance with ships when raised, and a fixed boom forming an extension of the traversing track on the land side. The trolley, which runs on the bottom boom of the main girder, is equipped with an underhung slewing-type jib and carries the main machinery house and also the driver's cab.

The outreach of the hinged boom allows the grab to handle ore from 14,000-ton carriers having a 63-ft. beam, and a maximum height of lift of 80 ft. enables the grab to take ore from the bottom of the carrier hold under low-water spring tide conditions.

Total weight of the unloader with grab and all electrical equipment is 661 tons.

During normal operation the grab transfers ore from the carrier to a large hopper placed on the centre line of the waterside leg structure and immediately over one end of a conveyor belt 3 ft. 6 in. wide. The ore passes from the hopper onto a drop-bar grizzly feeder from which it is transferred to the belt conveyor, which runs at an inclined angle across the wharf to the landside of the machine. The conveyor is 80 ft. long, and, together with allied equipment, is built into the structure on the unloader and moves with it.

On the landward side of the unloader, two ore-transfer tracks at 22-ft. centres run along the length of the wharf on either side of a storage bunker. At the top end of the conveyor there are three loading valves which allow the ore to flow into wagons on either track or, alternatively, into the bunker.

Placed at a low level on the main structure are two motor-operated spotting hoppers which have a traversing distance to cover three lines of railway tracks. These hoppers are used for transferring ore from the grab direct into railway wagons and come into use in the event of the conveyor equipment being out of action. Again at the extreme landward side of the unloader, there is a fixed spotting hopper placed on the centre line of the outer transfer car track, and it is possible for the grab to feed ore direct into this hopper as a further alternative.

The structure is built up of rolled-steel sections and plates riveted together and braced in all directions to stand the loads and stresses resulting from heavy operational duties. The bridge consists of two parallel steel girders of lattice construction carried by two structural legs of the portal type designed to permit the trolley to pass through and at the same time give clearance for the slewing jib. The legs are crossed braced in a direction at right angles to the track, a portal opening being formed under the bottom girders for the passage of railway trucks. Wherever possible, broad-flanged beams have been used in preference to built-up members, and the main members of the legs follow this construction.

THE UNLOADER, DESIGNED AND CONSTRUCTED BY THE WELLMAN SMITH OWEN ENGINEERING CORPORATION, LIMITED, IS CARRIED ON 28 WHEELS, 16 OF THEM RUNNING ON THE WATERSIDE DOUBLE-RAIL TRACKS.

The trolley runway tracks extend the full length of the bridge and accommodate air hydraulic buffers at each end.

When in the lowered position the weight of the hinged boom is taken by steel folding ties pivoted at the top of the tower, which is of apex construction, braced to the top of the portal legs. Special attention has been given to the necessity for preserving rail alignment between the hinged and fixed runways, and heavy forged steel brackets of special design are fitted to the fixed track joists to act as a centring and aligning device when the cantilever boom is lowered into position. The two sets of tracks are maintained practically level, and this, in turn, has a beneficial effect on the riding qualities of the trolley.

The unloader is carried on compensated bogies arranged under each corner of the main tower, the bogies being attached to articulated rocker beams which, in turn, are pivoted in the lower end of each leg of the tower.

The trolley frame and hanger are combined to form one rigid structure, the hanger terminating in a circular steel path to take the slewing guide rollers which are attached to the central mast. The mast is of plated construction and fitted into it at the top is a heavy casting which carries the main pivot centre pin.

The jib is of lattice braced construction designed at the rear to carry the contactor house and main machinery house enclosing the hoisting

motors and gearing, the operator's cabin being suspended underneath.

The trolley is mounted on four double-flanged 2-ft. 6-in. dia. runner wheels, both axles being driven, each by a 72-b.h.p. motor through double reductions of spur gearing.

The Priestman grab is of the four-rope heavy duty type. The grab jaws are fitted with detachable manganese steel teeth.

The grab hoisting gear is of the double winch type, suitable for speedy manipulation by the crane driver, and there are no clutches to be operated.

All motors on d.c. supply are of the totally enclosed 1-hr. rated series wound crane type, manufactured by the General Electric Company, Limited. On a.c. supply the long-travel motors are of the slip-ring type and the rail clamp motors of the high torque squirrel cage type, all motors being of weatherproof construction. The control gear throughout is of Igranic manufacture.

DET DANSKE STAALVALSEVAERK, Frederiksvaerk, Denmark, has placed an order with Moeller & Neumann, GmbH, of Germany, for a continuous light section and wire rod mill.

THE Broken Hill Proprietary Company, Limited, has formed a new mineral exploration company, Haematite Explorations Pty., Limited, with a capital of £1,000,000. Exploration will not be restricted to the search for iron ore. BHP holds an oil exploration lease in Bass Strait, and extensive mineral leases in New South Wales, Queensland, Northern Territory, South Australia, and Western Australia.

"Hydrogen in Steel" Conference

OPENING lecture at BISRA's "Hydrogen in Steel" conference, to be held at Harrogate from October 11 to 13, will be given by Prof. A. R. Troiano, of the Case Institute of Technology, Cleveland, USA. He will deal with the role of hydrogen in the mechanical behaviour of metals.

The programme includes five other subjects for papers and discussions. These are:—"The Removal of Hydrogen from Liquid and Solid Steel"; "The Effect of Hydrogen on the Properties of Ultra High-tensile Steels"; "The Diffusion and Solubility of Hydrogen in Steel"; "Hydrogen in Weld Metal," and "'The Unknown': Unresolved Factors about Hydrogen in Steel."

Full details of the arrangements, together with application forms, can be obtained from the Technical Secretary, Metallurgy Division, British Iron and Steel Research Association, 11, Park Lane, London, W.1.

International Conference on "Creep and Fracture"

SPONSORS of a joint international conference on "Creep and Fracture," to be held in New York from August 25 to 28, 1963, and in London during October of the same year, are the American Society of Mechanical Engineers, the Institution of Mechanical Engineers, and the American Society for Testing Materials. The conference will be devoted to the mechanical properties of engineering materials at elevated temperatures, the emphasis being on the utilization, by the mechanical engineer, of creep and rupture data on current materials in the design of equipment to be used at elevated temperatures. The scope of the conference will be as follows:—

Fundamentals of Creep and Fracture.—Mechanisms—atomic lattice; dislocation; material; metallurgical structure, etc. Plasticity theory in creep—theoretical and experimental studies in uniaxial or combined stresses. Studies in relaxation, thermal and mechanical cycling, rapid and dynamic creep.

Design for Creep and Fracture.—Criteria for design—uniaxial and combined stress, thermal and mechanical cycling, relaxation, and creep behaviour of composite materials. Application and interpretation of creep and fracture data—information concerning particular materials, short- and long-time tests and extrapolation of data.

Service Experience of Creep and Fracture.—Correlation—service data with laboratory tests and methods of testing. Environmental effects—oxidation, corrosion, ablation, erosion, radiation, etc.

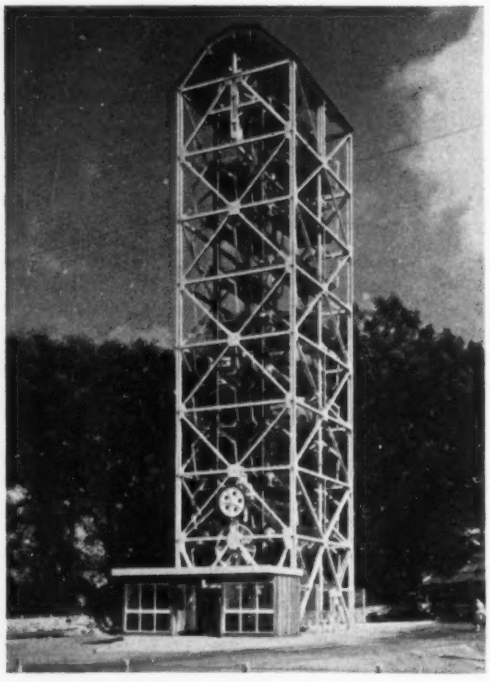
Tentative offers of papers, emanating from the UK, Africa, Asia, Australasia, and Europe, with the exception of Japan and the USSR, outlining briefly the scope, should be sent as soon as possible to the Secretary, Institution of Mechanical Engineers, 1, Birdcage Walk, London, S.W.1. Copies of letters should be sent for information to Mr. N. L. Mochel, conference secretary, Westinghouse Electric Corporation, Steam Division, Lester Branch P.O., Philadelphia 13, Pa. Offers of papers must be confirmed by abstracts not exceeding 250 words before June 1, 1962. Manuscripts must be received by December 1, 1962, for refereeing by the appropriate organizing committee. The proceedings of the conference will be published in English, but manuscripts may be submitted in any language.

HONEYWELL CONTROLS, LIMITED, Greenford (Middx), announces that the Honeywell ultra-vision flame detector has been reduced from £66 11s. to £45 (list). The detector, described as "a dramatic breakthrough in combustion safeguards," is generally used in conjunction with a flame failure relay. It is a "foolproof" safety device for furnaces, ovens, etc., because it senses only the ultra violet radiation in a flame, and ignores refractory radiation and other simulated flame conditions.

Automatic Mechanical Car Parking

TWENTY cars can be accommodated in a ground area normally covered by two cars by the Butterley Wulpa Liftpark, being introduced to this country by the Butterley Company, Limited, Ripley (Derbyshire). The mechanical system of parking cars is a bolted structure of universal columns which can be clad to individual requirements. The structure covers a ground area of approximately 24 ft. by 20 ft. and the height to the eaves is 75 ft. The standard roof incorporates three lifting beams and within the structure are housed 20 cabins, each capable of carrying a car with a maximum length of 19 ft. and a weight of 2 tons.

The cabins are coupled to a pair of 16-in. pitch chains, each of which has an ultimate breaking strength of 135 tons. The pitch chains run on fabricated steel chainwheels, the bottom pair of which are driven by a 45-h.p. electric motor through a reduction gearbox and gear train. The upper pair of chainwheels are mounted in a free-standing chassis which permits individual or simultaneous tensioning of the driving chains. A special spring device takes up any variation of tensioning caused by varying load.



WULPA LIFTPARK AT THE CAR PARK OF THE BUTTERLEY COMPANY, LIMITED, RIPLEY (DERBYSHIRE).

The cabins are guided in their vertical path by rollers, which run in special channel guides. A special patented device steadies the cabins on their path round the upper and lower chainwheels and ensures that the load on each cabin is maintained through the vertical axis. The chains have special guide rollers incorporated, which run in channel guides to ensure proper alignment. Lubricating attachments are within easy access for all moving parts of the equipment.

Operation of the Wulpa Liftpark may be by push button for manual control, or by key for automatic control. Speed of operation is such that cabins are returned to ground level in an average time of 30 sec.

FEWER MINING STUDENTS AT BIRMINGHAM

CHANGES in the Mining Department of the University of Birmingham are referred to in the 1961 edition of the Mining Technical Magazine. The number of mining students is declining and there was only one student in the second year and one in the first. The intake of freshers this year was slightly different from previous years. The total number was 13, five of these being minerals engineering students and three preliminary-year students.

Some of the laboratories have been refurnished to enable more efficient use to be made of the facilities for physical and chemical research on problems connected with mining and with coal and coal products. Further accommodation has been provided giving two or three additional small laboratories for work on dust, photoelasticity, and coal constitution.

The general research programme and research in mineral processing at Warren Spring Laboratory are outlined in two papers in the magazine by Mr. S. H. Clarke and Dr. A. J. Robinson, director and head of the minerals processing division, respectively, of the Warren Spring Laboratory of the Department of Scientific and Industrial Research.

Mr. A. H. Slade, chief fuel technologist of the National Coal Board, describes the technical service provided by the board's marketing department, while the detection and dispersion of firedamp in mines is discussed in a paper by Mr. J. G. Bromilow, chief ventilation engineer of the NCB. Other technical papers in the issue include:—"A Structure for Coal," by Mr. J. W. Purdie and Mr. C. Davies, of the coal constitution group, Department of Mining and Minerals Engineering, Birmingham University; "The Development of Igniter Cord and its Use in South Africa," by Mr. S. G. Blethyn, and "The Grängesburg Iron Mines," by Mr. A. M. Mann.

SATISFACTORY RESULTS were obtained from tests of a new coke produced from anthracite at the Voroshilov steelworks in Lugansk. Oblast, according to a Tass agency report quoted by the BBC.

New Literature

MENTION is made below of some of the house magazines, catalogues, booklets, and other publications received. Readers wishing to obtain a copy of any of the items should write to the address given, at the same time mentioning this journal.

CRAVEN BROS. (MANCHESTER), LIMITED, Vauxhall Works, Reddish, Stockport—Further details of the company's equipment supplied to the Durgapur Steelworks in India are given in the July-August issue of the Craven Machine Tool Gazette. Most of the machines supplied were designed and manufactured in the company's own works, while others were specified by the company and made by other firms.

SOLUS-SCHALL, LIMITED, County Building, Honeypot Lane, Stanmore (Middx)—Articles in the July number of the S-S News Letter include "Ultrasonic Test of Sheet or Strip Edges," "Ultrasonic Testing of Tubes and Bars," "Electro-magnetic Examination of Ferrous and Non-ferrous Tubes and Bars," "Non-destructive Techniques for Assessing Radiation Damage in Pressure-vessel Structural Materials," and "The New Flexispray."

INSTITUTE OF ECONOMIC PUBLICITY ABROAD, Beograd, Knez Mihajlova 10, P.O. Box 447—First-hand news of Yugoslavia's industry and trade is contained in Commercial Information, a 48-page magazine published for the Federal Chamber of Foreign Trade by the institute named above. It is well printed, attractively laid out, and profusely illustrated. The July number contains a survey of the steel and iron industry, with the aims and achievements of the current five-year plan well in mind.

RICHARD THOMAS & BALDWINS, LIMITED, 82, Brook Street, London, W.1—Controversy over the value of holding civil defence exercises persists, but RTB is one of the many industrial undertakings which is in no doubt. "Equipment and trained workers are ready for any civil disaster which may arise; civil defence is, in fact, a practical expression of service to the community," says the August issue of Ingot News, which carries a report on the company's civil defence units and on recent exercises.

BRADLEY & FOSTER, LIMITED, Darlaston Iron Works, Darlaston (Staffs)—Three of the main application categories in the specialist cast-iron field—those involving wear, corrosion, and heat resistance—are dealt with in "Special-purpose Alloy Cast Irons," an article in the summer number of Bradley's Magazine. The author, Mr. D. K. Southwick, the company's chief metallurgist, illustrates the most suitable specialist cast irons for these purposes. Some of the irons described, especially the higher alloy austenitic s.g. irons, are relatively new in this country.

SWEDISH CHAMBER OF COMMERCE FOR THE UK, 14, Trinity Square, London, E.C.3—The 1961 edition of the Anglo-Swedish Year Book (6s.) contains a series of surveys of developments in the Swedish economy written by leading personalities in the nation's economic life. The mining industry is covered by Mr. John Hedlund, director of the Swedish Mining Association, while Mr. Erik Ruist, head of the statistical department of the Swedish Ironmasters' Association, surveys developments in the iron and steel industry. Engineering, shipbuilding, and many other sections of Sweden's industry are covered similarly. Other features make the Year Book of considerable value to those carrying out trade with Swedish interests or contemplating doing so.

BUTTERLEY COMPANY, LIMITED, Butterley Iron Works, Derby—Eighteen months ago the company decided to carry out large-scale modernization of its foundries, the main objectives being to double production, modernize the mechanized section, and provide the best working conditions possible. The first phase of this scheme, which concerned the light and medium fettling shop, has now been completed. The July issue of Butterley Foundry News, recently received, outlines the project, the article being supplemented by the comments of Mr. E. Walker, general foundry manager, on "And This is What it Means to You."

IMPERIAL CHEMICAL INDUSTRIES, LIMITED, Imperial Chemical House, Millbank, London, S.W.1—Silicones (silicon + carbon + hydrogen + oxygen) form the subject of the main article in the August number of the ICI Magazine (2d.). Mr. J. Stafford, of the Nobel Division, the author, says: "It would be nice to think that scientists in real life behaved like some of the scientists in fiction, leaping out of bed in the middle of the night with a loud 'Eureka!' and jotting down the formula for some wonder-working substance. The sad truth is that it doesn't often happen like that. Successful discoveries are more often the reward for long, painstaking research than the result of a moment's inspiration. And usually the hardest part of the job is not arriving at a formula but in putting it to work—a matter of slogging away in the laboratory, in the plant, and in the user's factories. So it was with silicones."

BROOK MOTORS, LIMITED, Empress Works, Huddersfield—Mention of Hope Bank, Honley, near Huddersfield, will doubtless revive for some people memories of the days when it was a pleasure park, complete with a boating lake, paddling pool, bandstand, bowling green, and all the pleasures of an amusement ground set in well-kept gardens. Other people will have less happy memories of Hope Bank, which later became neglected and ugly. Buildings decayed and the lake dried up and filled with weeds, but the natural surroundings were still there, however, tall graceful poplar trees rising majestically above the unhappy scene below. The land was bought by Brook Motors. A factory has been constructed in a series of approximately 600-ft.-long bays, so chosen to allow unidirectional production of fractional horsepower motors to be planned on a modern scale, to give high output with a minimum of handling and labour. In planning the new factory the company determined to preserve the beauties of the countryside as much as possible. The visitor to Hope Bank today will find that this has been achieved. The story of "Factory in the Country" is related in the latest (No. 96) issue of the Brook Magazine.

THE WESTERN PRECIPITATION DIVISION, Joy Manufacturing Company, Pty., Limited, has been awarded a contract for the installation of four twin-unit precipitators for cleaning gases from four 600-ton oxygen-blown open-hearth steel furnaces at Port Kembla, NSW. The contract is for the supply and erection of precipitators on supporting steelwork erected by the client. The work will involve 800 tons of structural steel shells enclosing discharge and receiving electrodes.

NEW STEEL CREEP-TESTING LABORATORY

NEW creep of steel laboratory which has been built during the past year, on the ERA site at Leatherhead (Surrey), is concerned with the improvement in the efficiency of generation of electricity, primarily in steam-driven turbo-alternator sets, and is the latest stage of a long investigation that has developed continuously over nearly 40 years. In that period steam-raising conditions at power stations have risen from 600/sq. in. and 680 deg. F. (360 deg. C.) to 2,000/sq. in. and 1,050 deg. F. (565 deg. C.). The overall efficiency has consequently increased from under 20 to 34 per cent. in some cases.

This improvement has only been possible as the result of research on the high-temperature properties of the steels used in the generating plant. The ERA has been actively associated with that research since 1930 when it set up a committee, upon which steelmakers and turbine makers and users were represented, which sponsored the accurate investigation at the National Physical Laboratory of the high-temperature behaviour of certain typical steels. As a result, a creep-testing laboratory was built at the NPL and equipped with some 75 high-accuracy creep-testing machines. A number of steels were examined here and, in addition, members of the committee submitted appropriate experimental results obtained in their own creep laboratories. It soon became evident that short-term testing was not sufficient and periods of test had to be extended to times of the order of 20,000 hr. or more.

Test Programme Expansion

As knowledge of the properties of steels increased and steam conditions became more onerous, the number of special creep-resisting alloys to be investigated also rose. The test programme thus expanded to such an extent that the laboratory at the NPL could no longer cope with it, even though it had been reinforced by a further 50 machines installed in 1957 at the ERA laboratories at Leatherhead.

The organizations represented on the committee therefore decided to provide for an extended programme by means of a new laboratory at Leatherhead which would be devoted principally to long-time tests. This laboratory, completed at the end of 1960 with an area of 9,900 sq. ft., is equipped with 50 high-sensitivity creep machines fitted with optical extensometers, 50 10-specimen rupture machines and 50 dual-purpose machines for either dial gauge creep measurements or three-specimen multi-rupture. One 15-ton creep machine is included for testing specimens from the full wall thickness of steam pipes. In addition to the creep and rupture machines, 11 rigs have been installed, designed to test tubes stressed by internal steam pressure while at high temperature. Four such rigs have been in operation for several years at Leatherhead and will be retained.

The cost of building the new laboratory has been borne by the interested industrial organizations with the addition of a capital grant from the Department of Scientific and Industrial Research.

Rationalizing Structural Steel Production

PROPOSALS are under consideration for a new British Standard which will substantially reduce the number of sizes of steel beams rolled in this country. Such rationalization should lead to greater economy in steel production and thus improve the position of British makers of structural steel and British fabricators seeking business on the Continent and in other countries.

The proposal will permit of more frequent rolling of all sizes in the new list, resulting in speedier delivery and will assist in standardization in design, thus facilitating work in the drawing offices. The only effective way of ensuring cheap steel is by adopting a sensible range of sizes which will enable modern mills designed for mass production to be adequately loaded, and so achieve the minimum production costs of which they are capable.

Since the introduction of universal beams in 1958, the number of I and H profiles has risen to 71. Adoption of the proposals which have been submitted to the British Standards Institution will reduce the number to 27. Recently two more steelmakers have brought into operation universal beam mills and two other mills are planned.

The British Constructional Steelwork Association, representing the fabricators, is co-operating with the steelmakers.

The new British Standard now under consideration will be established, it is hoped, by the end of this year and that on January 1, 1963, the existing British Standard covering the sizes and weights of structural steel will be withdrawn.

JAPANESE STEEL MISSION IN AUSTRALIA

A JAPANESE steel industry mission has been in Australia to examine the possibility of joint Australian-Japanese development of New South Wales and Queensland coal deposits and Western Australian iron-ore deposits. The Japanese steel industry is reported to be interested in offering finance to Australian interests to help them to develop the deposits.

It is looking for guaranteed supplies of raw materials to help to achieve its annual production target of 48,000,000 tons by 1970. The decision to send the mission followed the recent visit to Australia by a Japanese trade mission. The industry mission comprises experts from Japan's four major steel companies—Nippon Kokan, Yawata, Fuji, and Kawasaki.

French Coal Cutback

BURDEN OF "SOCIAL" COSTS ON INDUSTRY

IN conforming with the Government's programme to reduce annual output from about 60,000,000 tons in 1959 to 53,000,000 tons in 1965, the French nationalized coal mines last year produced 1,500,000 tons less than in 1959. Despite this the industry could not prevent pithead stocks rising by over 2,000,000 tons, of which over 1,500,000 tons were of secondary quality. In the 12 months to mid-1960, stocks rose by some 750,000 tons, thus representing almost 45 per cent. of the total for the entire European Coal and Steel Community.

Charbonnages de France, in its annual report for 1960, states that in complying with the official plan for limiting production to mines that can produce fuel cheaply and so compete with other forms of energy, especially oil, it managed to reduce its personnel by 7 per cent. It also maintained progress in productivity (the yield is up by 42 per cent. in 10 years).

Financially, however, the year was less of a success. Instead of covering 94 per cent. depreciation charges with gross profits, it has been able to cover only 72 per cent. and the year closed with a deficit of NF 120,000,000 (almost £9,000,000). The reason has been the increase in social charges which have now amounted to 93 per cent. of wages, salaries, and production premiums, having risen by 8 per cent. last year alone.

The social provisions for miners, though affiliated with the general national scheme, are generous, and their weight has become heavier since the number of persons drawing pensions has risen by 70 per cent. in 10 years, while the number on the active list has fallen by 45 per cent. The report says that 80 per cent. of the reduction of expenditure through productivity has been wiped out by increases in these charges.

This year the charges will rise further and are expected to have serious consequences for the competitive capacity of the French coal industry, as other sources of energy and foreign producers are saddled with less heavy burdens.

New Power Stations for Durham Coalfield?

LIKELIHOOD of more power stations in the Durham coalfield was forecast by Sir Christopher Hinton, chairman of the Central Electricity Generating Board, when he spoke at Newcastle last Saturday, but he said it would depend on the availability of adequate supplies of reasonably-priced coal.

Until recently the CEGB had been discouraged from putting up more power stations in the north to use coal from the Durham coalfield because the National Coal Board felt that all the available coal from the area was needed for coking and ony small quantities would be available for power station use.

Sir Christopher explained that "now the Coal Board has told us that they will be able to supply us with Durham coal, and I think they will make the price attractive enough for us to build more power stations in Durham."

Inroads into Coal Stocks

WITH total coal consumption at 2,587,000 tons in the week ended August 12 and output under 2,000,000 tons, a further drop in coal stocks was to be expected. Undistributed stocks at 22,484,000 tons fell by about 100,000 tons and are 12,000,000 tons less than a year ago, and inroads were made into consumers' stocks. These had been piling up and were within 20,000 tons of the 16,000,000-ton mark. They have now dropped to 15,800,000 tons.

Output recovered last week to almost 3,000,000 tons, some 570,000 tons below the average for the first 33 weeks of 1961. There was a jump of almost 33 per cent. in the output of open-cast coal, but it is still only 6 per cent. of the total output of saleable coal. Over the year so far open-cast output represents only 4.2 per cent. of the total.

There were 564,540 wage-earners on colliery books on August 12, against 592,720 on August 13, 1960, the numbers engaged at the coal face being 212,050 and 225,990 respectively. Total absenteeism (all workers) in the week ended August 12 was 16.25 per cent., compared with 14.65 per cent. in the week ended August 13, 1960. Output at the face was 3.826 tons and overall 1.244 tons in the week ended August 12, compared with 3.787 and 1.310 tons in the week ended August 13, 1960.

The following table gives (in tons) the provisional figures of output of saleable mined coal by division in the week ended August 19, and the tonnage lost through disputes:—

Division.	Week ended August 19, 1961.		Week ended August 20, 1960.
	Total output.	Tonnage lost.	Total output.
Scottish ..	344,000	4,000	346,000
Northern (N&C) ..	141,000	102,000	234,000
Durham	329,000	122,000	330,000
North-Eastern ..	559,000	255,000	716,000
North-Western ..	228,000	1,000	251,000
East Midlands ..	635,000	260,000	770,000
West Midlands ..	157,000	106,000	259,000
South-Western ..	336,000	4,000	356,000
South-Eastern ..	23,000	—	27,000
Great Britain—			
Deep-mined coal ..	2,752,000	854,000	3,289,000
Open-cast coal ..	179,000	—	150,000
Other deep-mined (including licensed mines) ..	27,000	—	40,000
TOTAL	2,958,000	854,000	3,479,000

Board Changes

New Chairman for Joseph Sankey

NEW chairman of JOSEPH SANKEY & SONS, LIMITED, stamping and pressings subsidiary of Guest, Keen & Nettlefolds, Limited, from October 1 will be Mr. R. P. Brookes. He will replace Mr. H. F. Hodgson who is retiring from the position and as managing director on September 30. Mr. Hodgson will continue as a director of the company and also as a director of the parent company and other GKN group companies.

Mr. Brookes, a director of the parent company, and chairman of Garringtons, Limited, and other GKN companies, has been a director of Joseph Sankey for the last two years. Mr. G. B. Sankey, at present assistant managing director of Joseph Sankey, becomes managing director with effect from October 1.

WRIGHT & PLATT, LIMITED—Mr. W. J. Crockett has been appointed chairman.

ANDERSON BOYES & COMPANY, LIMITED—Mr. J. Menzies has been appointed a director.

JOHN WALLACE & SONS, LIMITED—Mr. J. R. Hendry and Mr. A. H. Cortez-Leigh, directors, have been appointed vice-chairmen.

RICHARD BAXENDALE & SONS, LIMITED—Mr. S. M. Thornley has been appointed commercial director and Mr. I. C. Smith, technical director.

ROCKWELL MACHINE TOOL COMPANY, LIMITED—Mr. J. M. Brice, Mr. H. A. Chambers, and Mr. H. Rockwell have been appointed to the board.

A.V. ROE CANADA, LIMITED—Mr. T. J. Emmert has been appointed president and chief executive officer of the company, which is a member of the Hawker Siddeley Group, Limited.

A. A. JONES & SHIPMAN, LIMITED—Mr. C. O. B. Wraith has been appointed financial director. Mr. E. Watts becomes secretary of the company in succession to Mr. Wraith who has relinquished the post.

BARROW HAEMATITE STEEL COMPANY, LIMITED—Mr. L. S. Carstairs, Sir Norman Hulbert, Mr. J. D. Brayley, and Mr. W. J. Darby have been appointed to the board. Mr. C. W. Kieft has ceased to be a director.

TECALEMIT (ENGINEERING), LIMITED—Mr. P. N. Nicholas, secretary of the parent company, Tecalemit, Limited, has been appointed secretary of Tecalemit Engineering and has joined the board of the company.

PEGLERS, LIMITED—Mr. J. M. Harrison has been appointed chairman. Mr. John Emberton, son of the retiring chairman, Mr. A. E. Emberton, and Mr. Ernest Webster, sales manager, have joined the board, from which Mr. Wilfred Weeks, secretary of the company has retired.

CHICAGO BRIDGE, LIMITED—Mr. Dean E. Stephan has been appointed managing director of the company, the UK subsidiary of the Chicago Bridge & Iron Company. He succeeds Mr. Cecil A. Wooten, who is now co-manager of Chicago Bridge et Provence, the newly-formed French affiliate of Chicago Bridge & Iron.

DELTA-ENFIELD ROLLED METALS, LIMITED—The Earl of Verulam is the first chairman of the company which was formed following the merger between the Delta Metal Company, Limited, and Enfield Rolled Metals, Limited. Other board members are:—Mr. C. C. Millar (vice-chairman); Mr. A. Lane (managing director); Mr. W. W. Dolton, Mr. S. Powell, and Mr. W. J. Vaughton. The company secretary is Mr. W. W. Rigg.

Mr. N. C. Lake Becomes BIM Regional Chief

DEPUTY managing director of Head, Wrightson & Company, Limited, engineers, iron and steel founders, etc., of Thornaby-on-Tees (Yorks), Mr. N. C. Lake has been appointed chairman of the north east regional council of the British Institute of Management. He succeeds Mr. Bryan R. Scholes, chairman and managing director of Heywood-Helliwell, Limited, Huddersfield, who now becomes vice-chairman.

A native of Hanley (Staffs), Mr. Lake received his early training with the Shelton Iron, Steel & Coal Company, Limited, Daniel Adamson & Company, Limited, and International Combustion, Limited. After seven years in the metals division of Imperial Chemical Industries, Limited, he joined Head Wrightson in 1936 as manager of a newly-formed department for the sale and design of rolling mill machinery for the steel and non-ferrous industries. Mr. Lake was appointed director and general manager, and later managing director, when that department became the Head Wrightson Machine Company, Limited. He remained on the board when, in 1957 he was appointed deputy managing director of the parent company.

He has twice been chairman of the Steel Works Plant Association and is a past president of the Cleveland Institution of Engineers and of the Cleveland Scientific and Technical Institution. He has served as a member of the council and on a number of panels of the British Iron and Steel Research Association and is a member of the council of the Iron and Steel Institute.

ENCOURAGING OUTLOOK FOR INTERNATIONAL NICKEL

FIGURES for the second quarter, covering the period to end-June last, presented by Mr. Henry S. Wingate, chairman of the International Nickel Company of Canada, Limited, strike a pleasant contrast to those of the two preceding quarters. Instead of a sharp setback, this time there is a slight improvement in both net sales and net earnings over the corresponding period. Furthermore, the $134,400,000 net sales and $18,993,000 net earnings figures for the latest quarter are both the best since the first three months of 1960.

Unfortunately, the setback in the first quarter of 1961 was so big that the position at the half-way stage of the current year is not as favourable as a year ago, especially in respect of net earnings per common share, but the chairman gives encouragement by the statement that nickel demand will strengthen further during the last six months of this year and prices of refined nickel have recently been raised by 10 per cent.

TO IMPROVE its sales service, the F·AG Bearing Company, Limited, manufacturers of ball and roller bearings, etc., of Wolverhampton (Staffs), has opened a new depot at 92 Broughty Ferry Road, Dundee (telephone: Dundee 83745) which will operate in conjunction with the Aberdeen branch (telephone: Aberdeen 50333/4) and between them serve Scotland just north of Methil to just south of Fort William. Service to the northern counties of England will now be dealt with by premises at Newcastle-upon-Tyne (telephone: Newcastle 24612).

IRON AND STEEL TRADE

SLIGHT improvement in the demand for structural steel and plate has given a brighter tone to the general outlook, although it is too early to say whether a turning point has been reached in the market. Any active steps to put idle steel furnaces back into commission will have to be preceded by a much more substantial demand for both heavy and light steel products. Judging by the amount of work on hand in the engineering, steel fabrication, and contracting industries, it would seem that a revival in the heavy side of the steel industry should not be much longer delayed. However, a repetition of last year's extended delivery dates is not likely to recur for some considerable time to come.

Pig-iron

Most of the foundries catering for the motor industry and general engineering and machine-tool trades are able to maintain a full working week, but they are not ordering supplies of pig-iron, except on a hand-to-mouth basis as they know that the furnaces carry good stocks and that they would get ample notice of any shortage developing. There is also plenty of pig-iron available for those foundries using mainly hematite, low phosphorus, and refined pig-iron.

There is not a lot of work on hand among the light foundries and this is affecting the call on high phosphorus pig-iron.

Ferro-alloys

The market has now returned to more normal levels and in general there is a fair demand for most items. Ferro-tungsten is a quiet feature, but ferro-molybdenum and ferro-vanadium are more active. The 75 per cent. silicon and 45 per cent. silicon grades of ferro-silicon are reasonably well supported, while ferro-chrome and ferro-manganese are quite active. Steady attention is given to calcium-silicide and certain consumers are favouring ferro-sulphide and ferro-phosphorus.

Interest in ferro-niobium has not yet fully revived, but there is a steady call on ferro-titanium and chromium metal.

Semi-finished Steel

Little change is reported in the position so far as the re-rollers are concerned. Most of them are back at work after the holiday recess, but at the moment there is no sign of any upward movement in demand for founds, squares, light sections, and strip.

The re-rollers have no difficulty in securing all they require in the way of billets. Ordinary mild steel and carbon qualities are freely available, but alloy steels are still subject to some delay in delivery. No difficulty is experienced by the steelworks in disposing of their arisings in defectives and crops.

Finished Steel

Demand is still much below normal and makers have plenty of capacity in current and forward rollings for additional tonnage in sections, plates, joists, etc. With the position in the motor industry showing little sign of appreciable improvement, makers are only too glad to undertake any business being offered for rods and sheets, and also cold rolled and hot rolled strip.

The call for colliery requirements is still well below normal and, without exception, additional tonnage would be acceptable by the makers.

TO CATER for increased orders, H. F. Shaw, Limited, nail manufacturers, etc., of Old Hill (Staffs), has moved to new premises at Sedgley (Worcs).

Ore Chartering

ALTHOUGH actual chartering of tonnage is not very active, there does, however, appear to be a reasonable to good general inquiry: the undertone of the market certainly appears to be steady and owners are hoping in many of the major trades that recent fixtures will certainly be maintained and also improved. Marmagoa ore to Japan has taken further September tonnage at 48s. 6d. f.i.o. and recently paid 42s. 6d. for an 11,500 tonner to Holland-Weser Range for September 10/October 31, and Vizagapatam to Antwerp reports 45s. 6d. f.i.o. for 10/11,000 tons min./max. for October 2/14.

The North African trade, however, particularly ore to the Continent, is still quiet with very few ships being chartered, but from the Black Sea manganese has been fixed from Poti to Boucau for about 5,000 tons for second half August at 37s. 6d. f.i.o. Other ore sections are quiet with Lulea/Gdynia-Gdansk-Szczecin reporting an 11,500 tonner at Sw.Cr. 8.00 with the option of Malmo loading at 11s. 9d. f.i.o. for a few consecutive voyages commencing August/September.

Pyrites from North Spain paid 20s. 6d. for a 5,700 tonner from Pasajes to the Tees for late August loading. Casablanca phosphate to Rotterdam or Vlaardingen reports 19s. 6d. for a 15,500 tonner for first half September loading and recent fixtures to the UK have been on the basis of 27s. 6d. for reasonably large tonnage to Immingham, with 34s. for Billingham and 38s. to Hull for handy sizes.

Takoradi bauxite to Burntisland has paid 50s. f.i.o. for about 5,300 tons for prompt loading and there is apparently some interest for September shipment.

Mather & Platt Acquires Australian Competitor

AT a purchase price of just under £A1,000,000, Mather & Platt, Limited, electrical, textile, and hydraulic engineers, etc., of Manchester, has acquired from Brambles Industries, Limited, the Australian industrial group, all the capital of Kelly & Lewis (Pty), one of the leading hydraulic engineering organizations in the Southern Hemisphere.

Mather & Platt's existing sales organization in Australia will be amalgamated with Kelly & Lewis, which has £A2,000,000 worth of orders on its books. By acquiring one of its leading competitors, it is considered that Mather & Platt should now be established as the largest pump manufacturer in Australia.

Mr. William L. Mather, chairman of Mather & Platt, will join the board of the Australian company.

Falling Orders Continue at Appleby-Frodingham

STATING that the downward order trend had continued, Mr. G. D. Elliot, chairman of Appleby-Frodingham Steel Company, branch of the United Steel Companies, Limited, told management and trade union officials recently that the company would have great difficulty in keeping the section mill working fully after the end of August, although the situation regarding the plate mills looked rather better and no difficulty was foreseen in keeping these fully occupied until mid-September. The company's current order book stood at 78,484 tons for plates and 27,996 tons for sections.

The company was not alone in the industry in "feeling the pinch," and in its sections of the trade was probably better off than its competitors, Mr. Elliot went on. Although there were 78,484 tons of plates on order, these could not be rolled until customers wanted them, and a carefully controlled programme of rolling would be necessary. Because of the general depression, the company's associated firms in Sheffield would almost certainly require less ingots, and a surplus capacity might exist for some time ahead. This would have repercussions on iron and coke-making, as well as those arising from the reduced demand for plates and sections.

Mr. Elliot warned that the company appeared to be in for "a more difficult time" than it had had to face for many years, but said he was confident it would emerge with its reputation as high as ever.

British Cold Forging Expert Lectures in Russia

LIVELY interest in the steel cold forging technique is being shown by the USSR, according to Dr. Ing. H. D. Feldmann, technical director of Cold Forging, Limited, Sunbury-on-Thames (Middx), who recently returned from a lecture tour of Russia. Dr. Feldmann is a well-known expert on cold forging and his company, one of the International Cold Forging group, with manufacturing plants in the UK, Germany, and Monaco, pioneered the design and manufacture of complete steel cold forging installations.

He received the invitation from the State Scientific-Technological Committee of the Council of Ministers of the USSR, and gave three lectures on the various aspects of cold forging in Moscow to an audience of technicians, professors, and lecturers. From discussions, he says, it was clear that the Russians had more than a slight acquaintance with cold forging. There were several small cold forging plants in the Soviet Union producing such components as bolts and nuts. Attempts had been made to produce spark plug bodies and needle bearing housings.

The Russians were impressed with the progress made in cold forging in the UK, and Dr. Feldmann thinks Russia will become a substantial buyer of cold forging installations in the near future.

TOP OF THE savings league in the North Staffordshire Area of the West Midlands Division of the NCB, Foxfield Colliery, Dilhorne, Stoke-on-Trent, on Tuesday received the Harold Lockett savings trophy.

French Steel Company's Progress

INCREASE of 13 per cent. to 230,000 ingot tons in the steel output of the Société des Forges et Ateliers du Creusot during 1960 is reported by the parent company, Schneider et Cie, in the annual statement. Exports also increased considerably and now account for over a quarter of the company's sales. Total foreign sales in 1960 amounted to NF 149,218,000 (107,249,000).

Most progress was made in the field of iron and steel where sales amounted to NF 55,000,000 (25,000,000). Exports of steel alloys rose to 14,700 tons, compared with 5,800 tons in 1959, and there was a considerable demand for special steels, in particular from the USSR which placed a large order for heavy stainless steel plate.

Much progress is also reported in the fields of atomic energy, hydro-electric power equipment, diesel engines, motors for electric and diesel electric locomotives, structural engineering, cranes, mining machinery, and equipment for the iron and steel and engineering industries.

During the past three years some NF 84,000,000 has been spent on modernization and expansion of the various plants.

GEC EXHIBITION

AN eye-opening cross-section of the wide range of manufacturing and research activities of the General Electric Company, Limited, and its associated concerns is provided by a visit to the exhibition currently running at the New Horticultural Hall, Westminster, London. Entitled "The New TV Show," extensive use is made of closed-circuit colour television.

A large variety of engineering exhibits includes a model of the 150-MW nuclear power station which is being supplied to the Japan Atomic Power Company at Tokai-Mura, 70 miles north-east of Tokyo (the reactor building being designed to withstand severe earthquake shock); a fully sectioned working model of a 200-mW reheat turbo generator of the type at present being supplied for installation at Kirkardine-on-Forth; a working model of four Sherwen electro-magnetic feeders operating in closed circuit; a segment of a low-pressure turbine wheel; a display illustrating the range of motors manufactured at the GEC Witton engineering works; and a working model of a side-discharge wagon tippler of a type in use in many steelworks.

New Tube Mill in South Africa

ONLY one of its kind in South Africa, a tube mill weighing 200 tons has been installed at the Vereeniging (Transvaal) works of Stewarts and Lloyds of South Africa, Limited. The mill, which cost R600,000, has a total maximum capacity of 15,000 tons a month and will produce light and heavy gauge welded tubing, ranging from 2 in. to 8 in.

It is equipped with a very high frequency welding head, capable of welding both low and high tensile as well as alloyed tubing. Tubes from 9 ft. to more than 40 ft. in length can be produced in the mill.

Coal for Gas

SELECT COMMITTEE'S REPORT

GASMAKING in the future is sure to be based to a considerable extent on coal and to a certain extent on oil, states the Select Committee on Nationalized Industries in its report on the gas industry. The National Coal Board accepts this, the report adds, knowing that in any case future gas from coal will have to be enriched by oil, but the NCB would like to see the use of coal and oil in future plants restricted to the proportion of two thirds coal to one third oil.

The committee discusses in detail the Gas Council's plans for importing methane, now awaiting Government approval, and the project for developing large-scale Lurgi plants, now under joint discussion between the Gas Council and the NCB. It notes that the Coal Board is keener on the Lurgi process than the Gas Council, which does not regard it as an alternative to methane (which it points out will still be needed as an enricher) and which is still doubtful about its costs. The report reveals that the Coal Board claims to have an alternative enricher to methane—a claim which has not so far been publicized.

The Coal Board is criticized by the Committee for failing to keep the price of its coal sold for gasmaking down to a low enough level to enable the gas industry to compete effectively—and failing to recognize until rather late in the day that it was in its own interests to help the gas industry. "While the NCB hac gone some distance to meet the gas industry's complaints, it seems that, so far as carbonization processes are concerned some of the prices at which the coal industry sells its products to the gas industry are uneconomic for both."

The committee concludes that it is essential for the cost of gas to be reduced if it is to hold its own as a fuel. New processes need to cost at least 4d. a therm less than the average cost of making gas in a conventional carbonization plant. The committee recommends the setting up of a 13th board (there are now 12 Area boards) with powers and responsibility for the generation of gas by large-scale processes and for its distribution.

Scottish NUM Valuation Appeal Dismissed

APPEAL by the Scottish Area of the National Union of Mineworkers against the raising to £450 of the valuation of its headquarters at Hillside Crescent, Edinburgh, was dismissed by Edinburgh Valuation Appeal Committee. Mr. John Wood, general secretary of the NUM Scottish Area, proposed that the valuation should remain at £300. He submitted that the premises had to be considered in relation to the use to which they were put. Although described as office premises, they were not used by a profit-making concern.

Comparison was made with a church and meeting hall and an RAF club. The increase in the first case had been 19 per cent., and in the second 44 per cent., while the £150 increase for the union premises represented a rise of 50 per cent.

Fall in Labour Force in Welsh Pits

TOTAL labour force in the Welsh mining industry fell in the three months from April to June from 88,304 to 86,445, according to figures issued by the office of the Minister of State for Welsh Affairs. While NCB pits in the South Wales coalfield lost more than 1,700 workers, major projects in the construction industry went on recruiting men, and between March and June the number at work rose by 200 to 16,500.

More than half of these were engaged on steelworks building and extensions—7,680 at the Spencer Steelworks, Llanwern, and 2,390 on extensions to the Steel Company of Wales plant at Margam (Mon).

Mr. Will Whitehead, Area president of the National Union of Mineworkers, writing in The Miner, the union's magazine, blames the Government for the feeling of insecurity in the South Wales coalfield and the growing drift of men from the industry. He says the Government took too long to reach its decision to reject the application of the Steel Company of Wales, Limited, to import cheap US coal.

"It was in May that the steel company made known that its application was being considered by the Government. The reply has taken three months to come through. In that time thousands of men have left the British mining industry and many hundreds have left the South Wales pits." Total manpower on July 22 was 566,160, a reduction in 12 months of 29,000 men. The picture relating to coal stocks was also serious. In 12 months, undistributed stocks of coal had fallen by over 12,000,000 tons.

"Unless this Government is more decisive in its policy towards coal mining, a crisis in coal supplies cannot be very long delayed," he warns.

BESTWOOD COMPANY, LIMITED—Mr. F. S. McWhirter has been appointed receiver and manager of the company, an investment and holding concern, and of its subsidiary, Plowright Bros., Limited, colliery and mechanical handling plant engineers, of Chesterfield (Derbyshire). The position is primarily concerned with Plowright Bros., the remaining subsidiaries continuing to trade profitably. With the heavy increase of turnover at the Plowright works the strain on its liquid resources has temporarily become too great and the position has been further aggravated by £150,000 of retention moneys outstanding on completed contracts not yet due to be paid. Holders are told that the Plowright order-book is full for the next six months and preliminary figures for its last six months' trading show a profit.

Coalfield News

Shots of the Peake Ripping Machine

EFFORTS by the National Coal Board to take the danger and back-ache out of mining are emphasized in the September issue of Mining Review, the board's newsreel, by impressive shots of a miner preparing a coalface from a safe distance with a Peake ripping machine. A glimpse of the old method of cutting stone from the face demonstrates the advantages of the new machine, which has been adapted for its present job by Mr. C. V. Peake, general manager of the No. 6 (North Barnsley) Area, North-Eastern Divisional Coal Board.

Some idea of the extent of the Lurgi gas project can be gained from shots taken during the recent visit of the Queen and the Duke of Edinburgh to open the Scottish plant at Westfield (Fife). The lighter side of the review is provided by a miners' pipe band.

MINERS AT Woolmet Colliery, near Edinburgh, are co-operating with Dr. J. A. D. Anderson, of the Northern General Hospital, in a survey of rheumatism in industry. The survey will continue for about a year.

TELEPHONE engineer at Old Roundwood Colliery, Ossett (Yorks), Mr. J. H. Flint has retired after more than 50 years at the colliery. He and his father, brother and uncle had a combined service of 200 years at the pit.

RESCUE SQUADS who worked in relays for more than eight hours on Thursday of last week to save a miner, Mr. Hugh Thomson (42), trapped by a roof fall at Overtown Colliery (Lanarkshire), found him dead when they had shifted tons of fallen rock.

STARTING WORK as a trapper boy at Deaf Hill Colliery, Co. Durham, when he was 14, Mr. John Hughes has retired after 51 years' service in the mines. He worked at several collieries in Co. Durham before going to Blackhall Colliery 12 years ago.

MINERS and colliery staff in the Wakefield Area of the North-Eastern Division of the NCB have raised £800 in the past month towards a fund for a chapel at Pinderfields Hospital, Wakefield, where miners receive long-term treatment for spinal injuries.

MODIFICATIONS MADE to the private bus which saves miners at Wharncliffe Woodmoor Colliery, Barnsley (Yorks), a four-mile walk each day, have been passed by the Yorkshire Traffic Commissioners. The bus proprietor had been told that he could not operate a three-times-a-day service without a conductor. He has now fitted controls so that the bus door can be opened by the driver.

AFTER 49 YEARS' service at Bullcroft Colliery, near Doncaster (Yorks), Mr. W. H. Hall has retired. He suffered serious injury when taking part in rescue work at the Bentley Colliery explosion in 1931, and since the opening of a medical centre at Bullcroft he has been medical room attendant. Mr. Hall was divisional superintendent of the Bullcroft Colliery, St. John Ambulance Brigade.

A COMEDY, Dear Strikers, written between shifts at Steetley Colliery, near Worksop (Derbyshire), by Mr. Clarence Stafford (46), a miner, is to be given its première in December at Chesterfield Civic Theatre. The play, Mr. Stafford's first, deals with miner's wives who stage their own strike when they discover that their husbands are planning a stoppage to get rid of a colliery undermanager. The official is unpopular with the men, but liked by the women. Mr. Stafford hopes to follow up the comedy with another also dealing with miners and called "Green Fingers."

DURING his visit to the Durham coalfield this week, Lord Robens, chairman of the National Coal Board, is to inspect the board's 180-ft. high boring tower now positioned near the entrance to the Tyne. Since it began boring off the Durham coast in the summer of 1958 it has proved undersea coal reserves of about 300,000,000 tons for the Durham coalfield. Weather permitting, Lord Robens will make the trip today (Friday).

SHIPMENTS of coal and coke from the South Wales ports last week recovered to 44,394 tons, an improvement of 14,268 tons on the previous week, but 11,479 tons lower than the corresponding week last year. Despatches from the various ports, with the figure for 1960 in parentheses, were: Newport, 5,896 (6,427) tons; Cardiff, 7,933 (7,877) tons; Penarth, 2,279 (2,222) tons; Barry, 13,031 (9,578) tons; Port Talbot, 1,327 (3,285) tons; Swansea, 13,928 (26,484) tons.

WINNERS of a surface tidiness competition in the No. 1 (South Northumberland) Area of the Northern (N&C) Division of the NCB were Algernon Colliery, Backworth (larger pits), and Loughbridge Colliery, Westerhope, Newcastle-upon-Tyne (smaller pits). Awards were presented to the two pit managers, Mr. D. W. Brooks (Algernon) and Mr. J. S. Pepperell (Loughbridge), by Mr. E. W. Potts, Area general manager, who said that it was hoped in future years to extend the competition to underground workings.

UNLESS HE can recover from a year-long illness and work for eight days before September 13, Mr. Joe Hallsworth, who has spent 40 years in the mining industry, is likely to lose his £203 retirement gratuity from the National Coal Board. It was under this rule, an agreement between the NCB and the National Union of Mineworkers, which states that a miner must work for 10 days between his 64th and 65th birthdays, that Mr. Arthur Moss was recently refused a similar gratuity after Lord Robens had personally reviewed the case.

Retires After 47 Years in Scottish Mining

DEPUTY Area production manager (planning) in the West Fife Area of the Scottish Divisional Coal Board for the past nine years, Mr. John Archibald has retired after 47 years in the coal mining industry. After gaining his first class certificate of competency as a colliery manager, he went into service with the Fife Coal Company, Limited, at Aitken Colliery as an oversman in 1923, subsequently serving as undermanager at Bowhill Colliery and manager of Lindsay, Aitken, and Comrie collieries. He also served as agent for the Comrie-Valleyfield group and of Cowdenbeath group.

Since nationalization, Mr. Archibald has served as agent of Kelty group of collieries, Area planning engineer of Fife and Clackmannan Area, and sub-Area production manager in the Fife and Clackmannan Area and the Fife Area, before taking up the post from which he has now retired.

Mr. Archibald's two sons are also in the mining industry: the elder Mr. D. Archibald, is agent/manager at Kinneil Colliery and the younger, Mr. J. H. Archibald, is undermanager at Michael Colliery.

THE COAL TRADE

FAR from being able to relax and reflect on holidays past or to come, or even to watch depot stocks mount into a comfortable buttress against winter's problems of transport and labour, merchants are being kept busy, not only trying to appease customers who find it difficult to understand why anthracite and other premium smokeless fuels are subject to delays in delivery, but also in executing the fairly constant flow of orders for domestic coals. Generally these are not for sizeable amounts, but in total keep demand above the normal August level.

DURHAM AND NORTHUMBERLAND

The market is recovering from holiday period lethargy and, for the time of year, there is a rather broader interest in domestic supplies, prompted partly by the weather and partly by the increase in housing generally as compared with a year ago. Steams generally continue to hold a steady position, with Durham and Northumberland descriptions moving off steadily and inferior sorts a consistent trade. This is clearing current output and continuing to bite into stocks.

The holiday period has left it difficult to assess the trend in general industrial fuel requirements but on this market, as yet, there would seem to be few, if any, signs of any recession in demand arising from the Chancellor's economic policy.

Delivery dates of most descriptions have shortened and order-books are not as healthy as they were. It was hoped that September would bring recovery but that seems optimistic, at least, until October. Durham coking coal and industrial cokes are correspondingly affected.

SOUTH WALES

Swansea—The demand for house coal has shown a marked improvement over the past week or two, but deliveries from the collieries cover the day-to-day needs of most dealers. Some little delay has been reported, however, in the case of group 3 coals.

The position for anthracite stove/stovesse beans and grains continues very difficult and merchants are reporting full order-books with a considerable delay in delivery. Phurnacite also is subject to heavy delay.

The picture is brighter with regard to dry steam cobbles and nuts. Industrial demand maintains its level of the past few months.

WEST MIDLANDS

Demand for house coal is above the level usual in August, mainly because of the cool weather. In addition householders are laying in stocks. Not much in the way of supplies has been coming forward from local collieries since the annual holiday and most merchants have very little in transit or in wagons at the depots. However, colliery-stocked house coal does not amount to much—a few thousand tons as against many thousands at this time a year ago.

Merchants' stocks continue to grow and, already, are above the level at which they stood when last winter began. A feature of this year's depot stocking is the accumulation of stocks by wholesalers on behalf of their merchant/dealer customers. Business in manufactured openfire fuels remains equal to merchants' contract tonnages and there is not a great deal in stock at the depots.

The market for solid smokeless fuels is somewhat patchy. There is a very strong demand for best anthracite stove nuts and private orders are now subject to some delay. Supplies from some of the smaller sources of production are on offer, but indifferent preparation tends to make these supplies less acceptable except under conditions of great shortage. Small anthracite qualities are very scarce and depots have not been able to put much to store. Dry steam nuts are none too plentiful, though the larger sizes can be obtained more readily. Phurnacite is coming through at a rate which permits current orders to be met, but little is available for stocking. Demand for domestic coke has freshened.

Demand for industrial coals is good; this is particularly true in respect of power station requirements for steam-raising smalls. Stocks in hand are well in excess of last year and the coming winter fuel position is very well covered. Doubles and singles are barely sufficient to meet the market's requirements, but most manufacturing units have a three weeks' winter stock in hand.

Requirements of hard coke in the industrial sector tend to vary considerably. Blast-furnace qualities are well absorbed, though demand is not so urgent.

Coal Chartering

RATHER more inquiry is noted from Hampton Roads to various destinations with emphasis on Japanese discharge, but despite the inquiry no heavy volume of tonnage appears to have been fixed. In so far as Japan is concerned, a 13,500 tonner for September 20/October 10 has been fixed at $10.25, 20,000 for September, and similar size for October at $9.35, and 20,000 tons has also been fixed for January loading at $9.25, the latter three with six days Shinc. Hampton Roads/Rio de Janeiro paid $6.85 for a 14,500 tonner with steamer discharging for September/October loading, and an August 10,000 tonner is reported to have obtained $7.00. Inquiry both to Japan and the Brazils is maintained.

There are also reports of large tonnage having been fixed from Hampton Roads to the Continent for September shipment at 27s. 9d., and petroleum coke has been fixed from Fort Arthur to West Italy for August/September at $6.75 f.i.o. Gdynia or Gdansk fixed an 8,000 tonner for August to Buenos Aires at 42s. 6d. f.i.o. basis, and also arranged 7,900 tons of coke to Alexandria for August at 54s. 6d., but very little is reported from the UK to the Mediterranean as apparently there is still difficulty in arranging stems. It would nevertheless appear that the undertone in so far as owners are concerned is steady.

Sydney (NSW) to Hirohata-Muroran Range reports 41s. f.i.o. and trimmed for 14,000 tonner, October 5/30, and Durban/Fushiki or Toyama 65s., 9,500 tons anthracite, f.i.o. and trimmed basis for September/October loading.

British Blast Furnaces in the June Quarter, 1961

(These tables are published through the courtesy of the British Iron and Steel Federation.)

Derbyshire, Leicestershire, Notts, Northants, and Essex.

Name of firm.	In blast at end of the second quarter, 1961.					Weekly average in blast.	Total existing at end of quarter.
	Hematite.	Basic.	Foundry and forge.	Ferro-alloys.	Total.		
Ford Motor	—	—	1	—	1	1	1
Holwell Iron	—	—	1	—	1	1	3
Renishaw Iron	—	1	1	—	2	2	2
Sheepbridge	—	2	—	—	2	2	2
Stanton Ironworks: Stanton-by-Dale	—	1	4	—	5	5	5
Staveley Iron & Chemical	—	1	3	—	4	4	4
Stewarts and Lloyds: Corby	—	4	—	—	4	4	4
Wellingboro' Iron	—	1	—	—	1	1	3
TOTAL	—	10	10	—	20	20	24

Lancashire (excl. N.-W. Coast), Denbighshire, Flintshire, and Cheshire.

Brymbo Steel Works	—	1	—	—	1	1	1
Darwen & Mostyn Iron	—	—	—	2	2	1.9	2
Lancashire Steel Manufacturing	—	2	—	1	3	3	4
Summers, John	—	2	—	—	2	2	2
TOTAL	—	5	—	3	8	9	9

North-West Coast.

Barrow Ironworks	1	—	1	—	2	2	2
Charcoal Iron	—	—	1	—	1	1	1
Millom Hematite Ore & Iron	2	—	—	—	2	2	3
United Steel: Workington	2	—	—	—	2	2·6	3
TOTAL	5	—	2	—	7	7.6	9

Lincolnshire.

Appleby-Frodingham Steel	—	4	—	—	4	4	4
Lysaght's Scunthorpe Works	—	3	—	—	3	3	4
Thomas, R., & Baldwins: Redbourn	—	3	—	—	3	3	3
TOTAL	—	10	—	—	10	10	11

North-East Coast.

Consett Iron	—	2	—	—	2	2	3
Dorman Long (Steel): Acklam	—	2	—	—	2	2	4
Redcar	—	—	—	—	—	—	2
Bessemer	—	2	—	—	2	2	3
Clay Lane	—	2	—	—	2	2	2
Gjers, Mills	2	—	—	—	2	2	3
Skinningrove Iron	—	2	—	—	2	2	3
South Durham Steel & Iron: West Hartlepool	—	2	—	—	2	2	3
Cargo Fleet	—	2	—	—	2	2	3
TOTAL	2	14	—	—	16	16	26

Scotland.

Bairds & Scottish Steel: Gartsherrie	1	—	1	—	2	2	4
Carron	—	—	1	—	1	1	2
Colvilles: Clyde Iron Works	—	3	—	—	3	3	3
Ravenscraig	—	1	—	—	1	1	1
TOTAL	1	4	2	—	7	7	10

South Wales and Monmouthshire.

Guest Keen Iron & Steel: Cardiff	1	2	—	—	3	3	4
Thomas, R., & Baldwins: Ebbw Vale	—	3	—	—	3	3	3
Steel Company of Wales: Margam	—	5	—	—	5	4·2	5
TOTAL	1	10	—	—	11	10.2	12

The Scrap Markets

Little Sign of Improvement

IT has been the doldrums for the scrap market for some time now and there is, as yet, no sign of a favourable wind.

The position has worsened recently with the closing of several steel furnaces and a gearing down in pig-iron outputs in accordance with the reduced consumption of steel ingots by the rolling mills.

Meanwhile stocks of scrap on the ground, at steelworks, and in merchants' yards are substantial.

Cleveland — Few labels are being issued by the steel plants for deliveries of steelmaking scrap. With large stocks on hand, several firms are not accepting any more at present while other plants are taking modest and intermittent supplies which are far below the quantity of material available.

Steel foundries are maintaining a steady demand for short steel scrap, but cast iron scrap has fallen away.

The demand for destructor scrap and turnings for blast-furnace use is placing no pressure on the balers.

Scotland — In Glasgow and the west of Scotland the iron and steel scrap market is slowly returning to business after the annual holiday break. Steelworks have now issued weekly quotas to their suppliers and merchants have been forced to reduce their deliveries accordingly.

It is to be hoped that this situation is only a temporary one, but at this stage it is extremely difficult to forecast for any time ahead.

At the cast-iron foundries business con-

tinues on a fairly brisk basis and buyers are constantly on the look-out for suitable parcels of cast-iron scrap.

South Wales—There is little or no improvement from the local market as steelmakers and ironfounders make every effort to work down their own stocks of scrap before accepting further deliveries.

The works have been closed for a fortnight, and this means that there has been even less movement of stocks. Merchants are finding it extremely difficult to continue, as trade is practically at a standstill.

The demand for steel sheet is not showing any improvement and until the motor car industry shows a considerable improvement, stocks of steel sheets are likely to increase.

CANADIAN STEEL ingot production in the week ended August 5 amounted to 122,810 tons, an increase of 3.8 per cent. over the preceding week's total of 118,305 tons.

British Blast Furnaces in the June Quarter, 1961—*continued*

Staffordshire, Shropshire, Worcestershire, and Warwickshire.

Name of firm.	In blast at end of second quarter, 1961.					Weekly average in blast.	Total existing at end of quarter.
	Hematite.	Basic.	Foundry and forge.	Ferro-alloys.	Total.		
Goldendale Iron	—	—	1	—	1	1	2
Shelton Iron & Steel	—	3	—	—	3	3	3
Stewarts and Lloyds: Bilston	—	1	—	—	1	1	2
TOTAL	—	4	1	—	5	5	7
Sheffield.							
Park Gate Iron & Steel	—	2	—	—	2	1·9	2
GRAND TOTAL	9	59	15	3	86	85·6	110

Weekly Average Number of Furnaces in Blast during the June Quarter, 1961, and the Previous Four Quarters

District.	1960.			1961.	
	June.	Sept.	Dec.	March.	June.
Derby, Leics., Notts., Northants, and Essex	20.6	20.3	20.1	20	20
Lancs. (excl. N.-W. Coast), Denbigh, Flint, and Cheshire	6.4	6.9	7	7	7.9
Lincolnshire	8.4	9.3	10	10	10
North-East Coast	17	17.6	17.9	17.7	16
Scotland	6.9	7	7	7	7
Staffs., Shrops., Worcs., and Warwicks.	4.5	5	5	5	5
South Wales and Monmouth	11	10	10.2	10	10·2
Sheffield	2	2	2	2	1·9
North-West Coast	8	7	7.8	8	7·6
TOTAL	84.8	85.1	87	86.7	85·6

The following companies have furnaces in course of construction or rebuilding:—Dorman Long (Steel); South Durham Steel & Iron Company, West Hartlepool Works; Colvilles, Ravenscraig Works; Ford Motor Company; Barrow Ironworks; and R. Thomas & Baldwins, Spencer Works (two furnaces).

More Cuts in Iron and Steel Production

FALLING demand for basic pig-iron has resulted in moves by a number of companies to cut back production. The Stanton Ironworks Company, Limited, a subsidiary of Stewarts and Lloyds, Limited, on Friday closed down one of its five blast furnaces, while short-time working, to start this week, was announced by the Sheepbridge Company, Limited, Chesterfield.

The moves are the latest in the series of production cuts in the iron and steel industry, which, last month, was estimated to be working at only 80 per cent. of capacity.

At Stanton Ironworks, other jobs within the works are to be found for the 35 men affected. At the Sheepbridge Company, 40 men a week will be on short time for an unspecified period.

Due to a falling-off in demand for heavy plates, the South Durham Steel & Iron Company, Limited, is to reduce further the number of shifts at its West Hartlepools rolling mills from 17 to 12 a week, and the working week from 42 hours to 32 hours. Only a small number of men will be involved in the change, which comes into operation on Monday. About 100 men in the rolling mills are already working fewer shifts.

Sheepbridge Engineering Prospects "Look Good"

WITH orders on hand at March 21 last substantially higher in value than at any previous year-end, Lord Aberconway, chairman of Sheepbridge Engineering, Limited, electrical engineers and manufacturers of colliery machinery, of Chesterfield (Derbyshire), says that prospects for the company in the current year "look good," but he points out that the profitability of the business is highly susceptible to volume, and adds that, in view of the country's critical economic position, the directors regard the future with caution.

Nevertheless, subject to any general deterioration in trading conditions, increased turnover should offset narrower trading margins and the overall profit should be maintained. Lord Aberconway says that the increase in production last year was made possible largely by the decision to incur greater expenditure than usual on capital equipment. Without this expenditure, demands, especially from the motor trade, could not have been met.

FORMER STEEL erector, Mr. John William Thompson (45), was awarded total damages of £2,536 and costs against Niagara Forge (Sheffield), Limited, at Leeds Assizes.

Company News

Hawker Siddeley Forms Engineering Division

TO handle the design and construction of comprehensive engineering projects such as electrical power schemes and harbour installations, Hawker Siddeley Industries, Limited, holding company for the Hawker Siddeley Group, Limited, is to form a new division under the name of Hawker Siddeley Engineering, Limited. Backed by the resources of the group, the new division will draw on the industrial products of all the group's factories in the UK and oversea.

Commenting on the formation of the new division, Sir Roy Dobson, vice-chairman and managing director of the Hawker Siddeley group, said: "By integrating the latest aviation techniques with our traditional heavy engineering skills, we can offer a new kind of industrial packaged deal, centrally planned and controlled by a single contractor. What we cannot supply within the group, and we expect to be as much as 90 per cent. self-sufficient on the majority of projects, we shall buy from other British companies."

He went on, "Some 70 per cent. of our industrial output already goes oversea, and we are confident that the new division will create opportunities for further expansion in the export market." He called the venture "automation with muscles."

Administration and general direction of Hawker Siddeley Engineering will be the responsibility of Mr. R. G. McCoy, assisted by Mr. I. Blick.

A. A. JONES & SHIPMAN, LIMITED, manufacturers of machine and small tools, of Leicester—An interim dividend of 5 (3½) per cent. for 1961, is being paid on capital doubled by a scrip issue. Mr. F. G. Morris, the chairman, is to outline future dividend policy in a statement to be circulated.

TAP & DIE CORPORATION, LIMITED, precision engineers, of London, W.1.—Final dividend of 12½ per cent. makes 20 per cent. for the year to May 31, 1961. A total of at least 17½ per cent. had been forecast. Last year's similar payment included a 2½ per cent. 10th year bonus. The net profit balance, after tax, etc., is £375,156 (£244,919).

INTERNATIONAL COMBUSTION (HOLDINGS), LIMITED—Interim dividend is maintained at 10 per cent. on increased capital and the directors say that present indications are that profit for the year to September 30, 1961, will be lower than for the previous year, but they hope to recommend payment of the same 30 per cent. total rate of dividend as last year.

COLVILLES, LIMITED, iron and steel manufacturers, of Glasgow—Regarding the issue of 5,324,906 ordinary shares of £1 each at 57s. 6d. per share, about 9,300 acceptances were received from the shareholders of the company for a total of 808,142 ordinary shares and accordingly the underwriters have been called upon to take up the remaining 84.8 per cent. of their commitments.

PARMITER, HOPE & SUGDEN, LIMITED, makers of fluvent switchgear, of Manchester—Ordering rate at the end of year was a record for the company and exceeded the target at 112 per cent. Output of the parent company had been increased to 98 per cent. of the target figure, states the chairman, Mr. Eric W. Sugden. The dividend of 20 per cent. reverts to the level of two years ago.

B. ELLIOTT & COMPANY, LIMITED, machine tool manufacturers, of London, N.W.10—Net profit for the year to March 31, 1961, rose to £122,508 (£84,217), after heavier tax of £125,302 (£84,676), and final dividend is being maintained at 10 per cent., as forecast, on capital increased by a 50 per cent. scrip issue, representing an effective rise of 3⅓ per cent. The interim on the old capital was unchanged at 7½ per cent.

ALBRIGHT & WILSON, LIMITED, manufacturers of industrial chemicals, of London, S.W.1—Group trading profits, before depreciation, amounted to £4,358,000 in the first half of 1961. Adjusted to include estimated profits of W. J. Bush, Limited, the comparable balance in the six months to June 30, 1960, was £4,419,000. The interim is maintained at 6 per cent. on capital increased by the Bush merger. A total of 20 per cent. was paid for 1960.

STEEL & COMPANY, LIMITED, engineers, contractors, etc., of Sunderland (Co. Durham)—Final dividend of 12½ per cent. is being paid for the year to March 26, 1961, on capital increased by a one-for-six rights issue. The interim, on the old capital, was held at 10 per cent. Group profits have more than recovered the previous year's fall, the balance, before tax, expanding to a record £1,276,471 (£720,627). The net balance attributable to the group has risen to £624,973 (£325,565), after tax of £646,476 (£389,090).

ELECO, LIMITED (formerly the Engineering & Lighting Equipment Company, Limited)—Final dividend of 13⅓ per cent. is recommended, to make the equivalent of 25 per cent. for the 15 months to June 30, 1961. This equals 20 per cent. per annum and compares with the previous year's equivalent of 10 per cent. Group profits, including 15 months' trading of parent and two years' of subsidiary acquired in July, 1959, amounted to £328,564 against £136,111 for the previous year. After tax, the net balance of £131,228 compares with £70,859.

W. G. ALLEN & SONS (TIPTON), LIMITED, colliery, light railway, and mechanical engineers, of Tipton (Staffs)—After a loss of £31,670 in 1959-60, the company reports a net taxed profit of £13,971 for the year ended March 3, and is paying a dividend of 2½ (nil) per cent. An amount of £60,000 has been transferred from general reserve to meet a capital loss on a trade investment. The loss—which has not been included in the year's trading balance but will appear on the balance sheet—refers to a Rhodesian associated company.

WILLIAM JACK & COMPANY, LIMITED, metal, alloy, and pig-iron merchants, etc., of London, E.C.2—The group's 1960 results were better than those for 1959, turnover increased, and the company's exports rose by £200,000 to £4,667,000. Net profit was £156,233 (£103,523), and the dividend is raised from 6d. to 7½d. per 5s. share. There is again a 2d. per share capital distribution with a one-for-10 scrip issue proposal. The chairman, Mr. W. Gray Buchanan, points out that the scrip issue will increase the issued capital to over £1,000,000 and will make the ordinary shares eligible for trustee investment.

BRITISH STEEL PILING COMPANY (HOLDINGS), LIMITED—Chairman, Lt.-Gen. M. B. Burrows, says in his annual report that at the start of 1961 business was much better than in 1960, but he is not sure that the improvement will be maintained. He hopes that the results will be "at least as good" as the previous year. For its steel piling division the company's tonnage of orders booked during the first four months of 1961 was higher than for the corresponding 1960 period, but more recent trends have not maintained the comparative position, and the chairman will be "agreeably surprised" if the rate of activity is maintained during the second half.

Photo by permission of Esso Petroleum Co. Ltd. Purfleet, Essex.

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where 300 lengths of Goodyear oil discharge hose are used in the ships exchange layout, the batch blending section of the new lubricating oil warehouse and the road/rail tanker loading bays. Resisting attack by mineral oils, greases and most industrial solvents, Goodyear Oil Hose is immensely strong yet flexible, with a tough cover that stands up to abrasion and gouging. It is one of more than 500 types of Goodyear hose built for specific needs—Write today for full information.

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NEWS IN BRIEF

A PLANNING APPLICATION for an extension to the ironfoundry of Seagers, Limited, has been approved by Dartford (Kent) Corporation.

PLANNING COMMITTEE of Glasgow Corporation has instructed the Town Clerk to open negotiations with Weir Foundry, Limited, Pontefract (Yorks), with a view to acquiring Weir's disused foundry at Thornliebank, Glasgow

PRECISION ENGINEERS of Clevedon (Somerset), Engineering Productions (Clevedon), Limited, has obtained a licence from the American Metal Products Company, of Detroit, to make "Fiberglide" dry bearings for sale in Britain and the European Free Trade Area.

A SUBSIDIARY, Water Engineering, Limited, has been formed by Combustion Chemicals, Limited, London, N.W.1, to manufacture in the UK under licence the range of water clarification and purification plant marketed on the Continent by Cie. D'épuration et de Traitement des Eaux, of Paris.

EXHIBITION of industrial electronic equipment will be staged by the electronic apparatus division of Associated Electrical Industries, Limited, in conjunction with the Merseyside and North Wales Electricity Board, from October 2 to 6 in the Electrical Industrial Development Centre, Liverpool.

ACCORDING TO reports, Japan is expected to produce 26,500,000 tons of steel this year against Britain's estimated 24,500,000 tons and will thus take the place of Britain as fourth among the world's crude steel producers. Japanese production in the first half of this year was said to be 810,000 tons over that of Britain.

DECISION of the Central Electricity Generating Board to seek permission to build a 2,000 mW oil-burning power station at Fawley, on Southampton Water, "did not imply that total consumption of coal in UK power stations would decrease," the CEGB stated last week. On the contrary, it was expected to increase.

POSSIBILITY of establishing a steelworks in Eastern Nigeria at a cost of between £30,000,000 and £40,000,000 is being studied by the regional Government. Dr. Okpara, Prime Minister, said on Wednesday that one American and one German company had been approached about the scheme, but no details were yet available.

REDUCTIONS of between 5 per cent. and 33 per cent. in the prices of its entire range of Greer-Mercier hydro-pneumatic accumulators and alleviators are announced by Fawcett Preston & Company, Limited, Bromborough (Ches), a member of the Metal Industries, Limited, group. The range has been standardized to 18 models.

INVESTIGATION of US energy policy, with special reference to independent domestic coal and oil producers, is to be made by a special committee of the House of Representatives. The study will seek to find out whether small producers are being sufficiently encouraged to develop supplies which may be needed in a national emergency.

FIRST BLAST FURNACE in Portugal, belonging to the Siderurgia Nacional, was lighted yesterday (Thursday). The furnace is part of a steelworks built by a West German-Belgium consortium at Seizal. The initial annual capacity of the works is 250,000 tons, but this is to be expanded later. Products will include bars, rods, strip, and certain steel sections.

SIXTY MEN, about a third of the labour force at the Crook (Durham) silica brickworks of Pickford, Holland & Company, Limited, have been paid off following the cancellation of an order from a steel company. The firm stated that the demand for silica products was declining rapidly and manpower needs at the Crook plant were being reviewed.

POSSIBILITY of a guaranteed wage in the slack periods is to be put to the Engineering Employers' Federation as part of a new wage structure to be pursued by the executive council of the Confederation of Shipbuilding and Engineering Unions. The Confederation is also seeking the establishment of a system of work-sharing when work is reduced.

AVERAGE of about 12,000,000 benefits and allowances are being paid each week by the Ministry of Pensions and National Insurance, at a cost of over £1,200,000,000 a year, says the Ministry's Report for 1960. Claims for sickness benefit during the year were over 8,000,000, for unemployment benefit nearly 2,500,000, and for industrial injury benefit over 860,000.

DIRECTORS OF Klöckner-Humboldt-Deutz, a leading West German heavy engineering firm, reveal in a letter to shareholders that turnover in the year to June 30 last amounted to DM 1,120,000,000, an increase of 10 per cent. on the previous year. Exports amounted to DM 400,000,000, and accounted for 36 per cent. of total turnover against 32 per cent. previously.

COAL FOR US forces stationed in West Germany—just over 1,000,000 tons a year—is to be bought from domestic sources in the US instead of from West Germany it was announced in Washington on Wednesday. This measure is designed both to reduce the balance-of-payments drain and to assist depressed areas in America, but the cost will be some 25 per cent. higher.

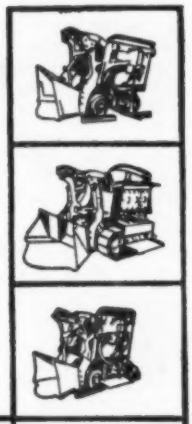
DURING THIS week "open days" at the Sheffield works of the English Steel Corporation, Limited, have enabled the 10,000 employees to take their families on evening tours of the factory. A route through the works has been signposted and labelled and visitors have been able to see the melting shops, forges, rolling mills, machine shops, foundries, the spring shop and the apprentices workshop.

LICENCE AGREEMENT has been concluded by Vickers-Armstrongs (Engineers), Limited, for the manufacture of Formseal packaging machines at its Crayford (Kent) works. A French invention, Formseal has previously been manufactured in France and has been offered for sale in the UK by John Kimbell & Company, Limited, London, S.W.8, who will continue to market the British-built machines.

AMONG THE most noteworthy developments in 1960 was the laying of the corner stone of the new steel mill at Taranto, says the Italian Institute for Industrial Reconstruction. Both for its size and technical level, it is stated, the new mill will be able to compete successfully on the Italian as well as the international markets. For 1961, total overall investments by the group is expected to reach some L. 413,000,000,000,000.

ALL BUSINESS in certain types of cable previously manufactured by Associated Electrical Industries, Limited, and Enfield Cables, Limited, has now been transferred to Telephone Cables, Limited, Dagenham (Essex). This company, formed last January and jointly owned by AEI and Enfield Cables, is now handling all home and export busines for both companies in the field of paper insulated and polythene insulated tele-

Wherever the going is tough you'll find an EIMCO



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phone cables, and in co-axial and other high-grade cables and telecommunications.

TO HANDLE THE increased demand for its "Marlow" synthetic fibre ropes, Hawkins & Tipson, Limited, has formed a separate company. Personnel for the new company—Marlow Ropes, Limited—will be transferred from the parent company's synthetic rope-making division to form the staff. Directors of Marlow Ropes are:—Mr. J. E. Hawkins (chairman), Mr. J. C. Stickland, Mr. J. G. Giddins, Mr. W. J. Temple and Mr. W. E. Mills.

AFTER TALKS held on Thursday of last week between representatives of the Boilermakers' Society and the Shipwrights' Association at Newcastle-upon-Tyne, amalgamation of the two unions, often involved in demarcation disputes, seems nearer. Mr. V. Feather, assistant general secretary of the Trades Union Congress, which joined in the discussions, said that "good progress" had been made. The conference will be continued next month.

LOAN EQUIVALENT to $23,500,000 has been approved by the World Bank to the Territory of Trinidad and Tobago for electric power development. It will help finance the construction of a 100,000 kW thermal power plant at Port-of-Spain, the construction of a 41-mile natural gas pipeline to supply fuel for the plant, and the expansion of transmission and distribution facilities. Total cost of the project is estimated at the equivalent of $37,700,000.

FOLLOWING THE opening recently of the new Coal Aston airstrip, near Sheffield, all the main plants of the United Steel Companies, Limited, are connected by air. Because Sheffield has no airfield, United Steel bought 109 acres of land to develop the 800 yards long Coal Aston airstrip. Other airstrips are at Scunthorpe and Workington. The United Steel organization, a founder member of the Business Aircraft Users' Association, bought its first executive aircraft three years ago.

LIMITED TO STUDENTS up to the age of 25 years, the north west branch of the Institute of Metal Finishing is organizing a competition for the 1961/62 session. The subject matter is left entirely to the author, the only condition being that it should be allied to the art and science of metal finishing. The competition is open to any student whether a member of the Institute or not. Entrance forms may be obtained from:—Mr. F. Spicer, Suffield Cottage, Moorhead, Gildersome, Leeds.

RUSSIAN SECTION is to be set up in the export department of the Owen Organization as a result of its participation in the British Trade Fair at Moscow. The organization, parent company of which is Rubery Owen & Company, Limited, makes many products including fork-lift trucks, motor-car parts, and office furniture. Mr. L. Friedman has been appointed head of the new section with the title of director of exports (USSR division), and Mr. J. M. Garrett becomes director of exports.

Vacuum Melting Furnace for English Steel

THE vacuum melting furnace which is to be installed by the English Steel Corporation, Limited, Sheffield, will be of a consumable electrode type and will be capable of producing ingots of up to 6½ tons.

Owing to an error on the part of a correspondent the furnace was incorrectly described in our issue of August 11.

Higher Current Profits by Amalgamated Anthracite

FOR the first half of 1961, Amalgamated Anthracite Holdings, Limited, has maintained its position and shown a moderate expansion in profits, states Mr. J. Waddell, chairman, in his annual report. The benefit of the better order-books of some of the group's engineering companies should bring further improvements in the second half of 1961, but the outlook of the coal and transport companies is "obscure." Despite this, he sees no reason why the group should not live up to the better results achieved in 1960, and show a further improvement in overall results next year.

Results in 1960 improved by nearly 50 per cent. compared with 1959, and this makes it increasingly difficult to maintain the same rate of expansion, the chairman points out. Coal and transport activities generally showed an improvement and a steady holding up in turnover in 1960. While the group's engineering companies did better in 1960, both heavy and light engineering had a thin year, but this situation was now "in better shape."

Commenting on the export market, the chairman says that "indigestion of excessive stocks" in Europe is beginning to disappear and trade is getting down to a more basic pattern with prices beginning to show more firmness and a better relation to economic production costs.

World Register of Research Task for PERA

TASK of establishing a world register on production engineering research has been given to the Production Engineering Research Association, at Melton Mowbray (Leics). It will have the financial support of OEEC for two years. The register will help research workers and production engineers to keep fully informed about investigations carried out in research organizations, industrial firms, universities, and colleges throughout the world.

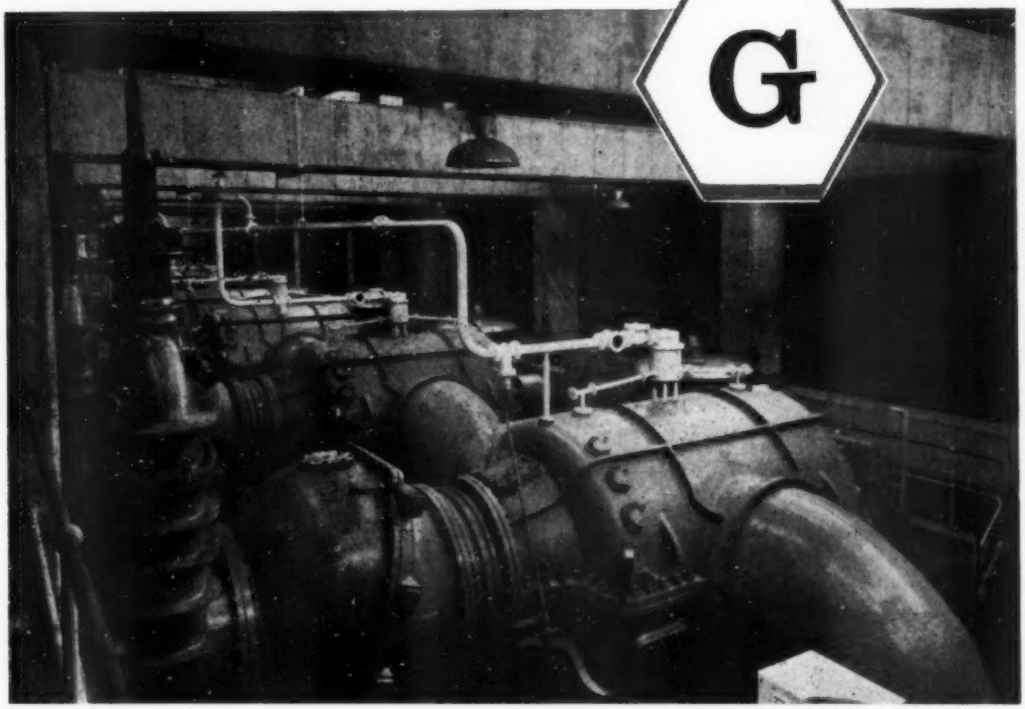
The world register will cover all production research carried out in the years 1959 to 1962, and will summarize plans for research for the following three years. Main subjects to be covered are: Automation, machine tools, materials handling, finishing processes, metal forming, assembly, inspection and measurement, metal cutting, machine ability, and formability of materials.

Steel Stress-relieving at Power Station

STRESS-RELIEVING of the first 70 ft. dia. reactor pressure vessel at Hunterston nuclear generating station, Ayrshire, Scotland, was successfully carried out by the Motherwell Bridge & Engineering Company, Limited. About 1,800 tons of steel, situated at a mean height of 85 ft. above ground level, was heated to a temperature of 550 deg. C., soaked for 12 hours, and then allowed to cool slowly.

The station is being built for the South of Scotland Electricity Board by the General Electric Company, Limited, and the Simon-Carves Atomic Energy Group. Construction of the pressure vessels was sub-contracted out to Motherwell Bridge & Engineering.

21,000,000 GALLONS AN HOUR FOR BELVEDERE POWER STATION



Wherever river, canal, or sea-water is needed in large quantities for public electricity supply or industrial power stations Richardsons Westgarth strainers will clean it efficiently and on almost any scale. The illustration shows some of the seven Richardsons Westgarth strainers that deliver 21,000,000 gallons of clean cooling water an hour to the condensers at the Belvedere Power Station of the C.E.G.B. These strainers are self-cleaning, operate continuously, and the accumulated sludge can be blown out at intervals without appreciably affecting the flow. Capacities range from 160,000 to 5,000,000 gallons an hour. Full technical details are available on request.

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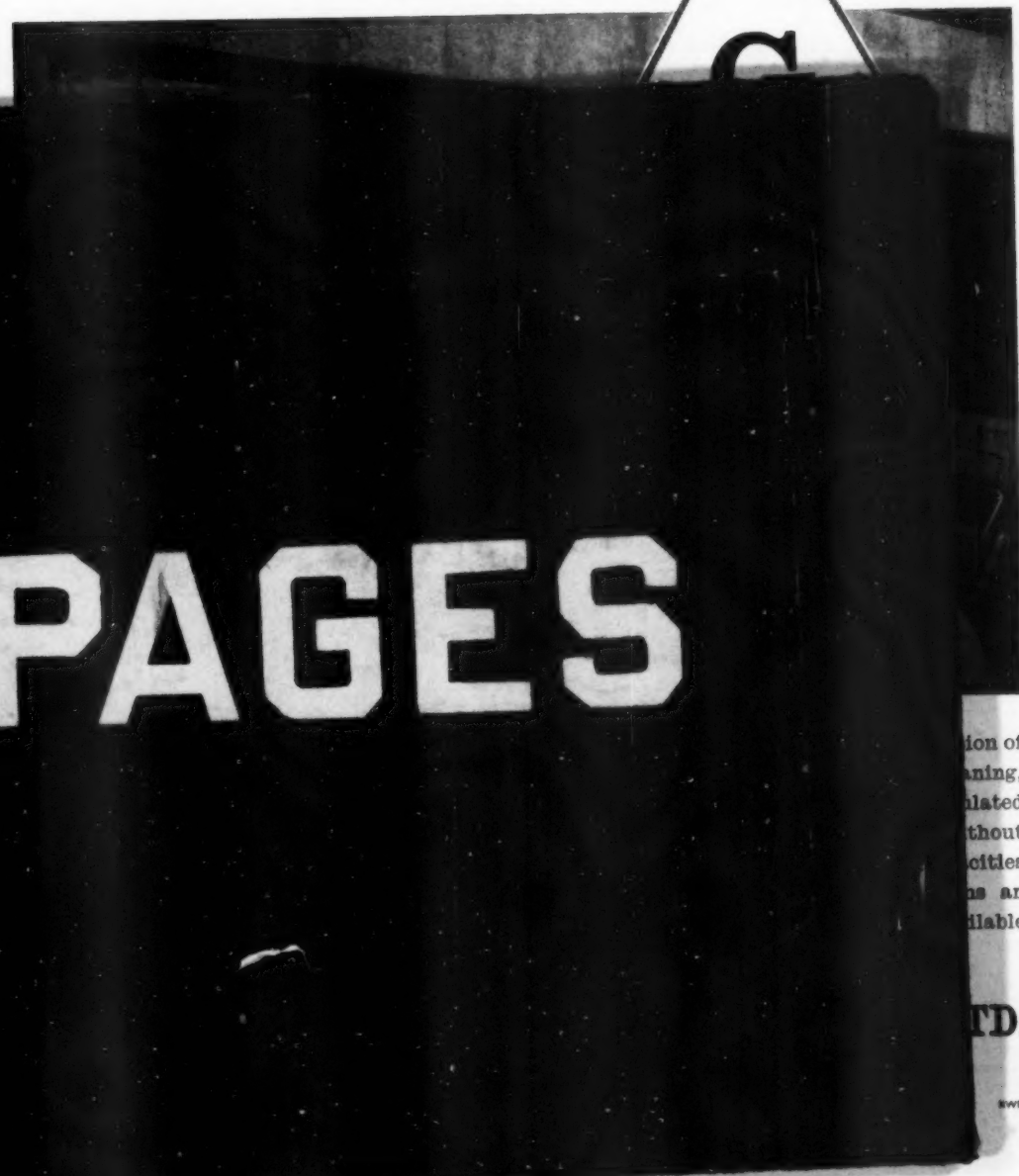

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SITUATIONS VACANT

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SITUATIONS VACANT—*contd.*

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SITUATIONS VACANT—*contd.*

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ASSISTANT MECHANICAL ENGINEER

Ore Preparation Plant

An Assistant Mechanical Engineer is required in the Ore Preparation Department in the Steel Division of the Steel Company of Wales Limited.

The duties involve all aspects of mechanical maintenance and the post will be under the direction of the Ore Preparation Plant Mechanical Engineer.

Applicants should be in the possession of their Higher National Certificate. A University Degree (Engineering) or Membership of appropriate Professional Institute would be an advantage.

Please write for application form to:—

The Superintendent, Personnel Services,
Steel Company of Wales Limited
(Steel Division)
Abbey Works, Port Talbot, Glam.

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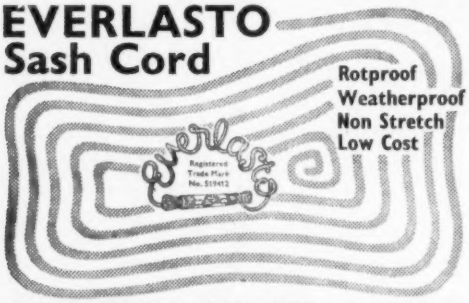

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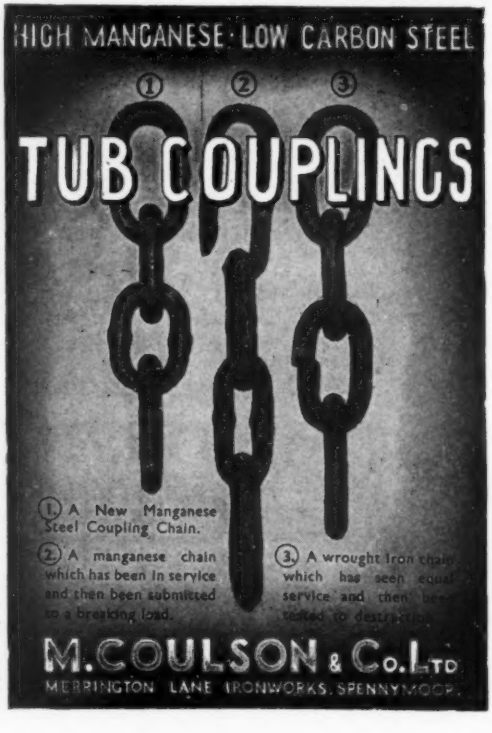

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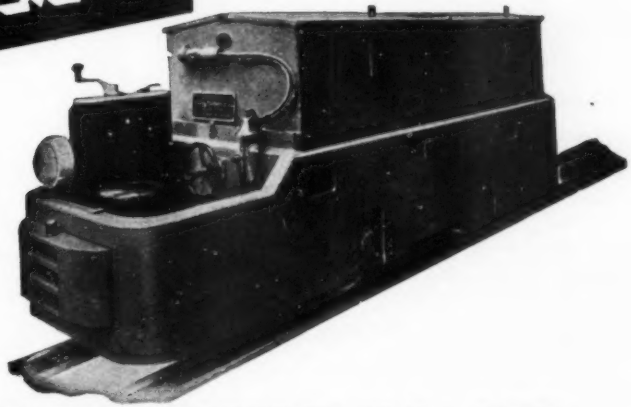

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Johnson Rolls Ltd. .. .. —
Jones, W. Stanley (Engineers) Ltd. .. .. .. —
Joy, Sullivan Ltd. 31

Kennedy, Allan & Co. Ltd. .. —
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Lanarkshire Steel Co. Ltd. 42 & 43
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Lilleshall Co. Ltd. .. .. —
Lindley, H. Ltd. 6
Lloyds (Burton) Ltd. .. 44
Locker Industries Ltd. .. —
Lodge-Cottrell Ltd. .. .. —
Lumb, Jas. & Sons Ltd. .. —
Lysaght's, Scunthorpe Works 15

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Vauxhall Motors Ld. .. 19
Victor Products (Wallsend) Ld. .. .. .. —
Visco Limited 21

Wade, Smith & Co. Ld. .. —
Wailes Dove Bitumastic Ld. —
Walker Bros. (Wigan) Ld. .. —
Wallacetown Engineering Co. Ld. .. .. .. —
Wallsend Slipway & Engineering Co. Ld. .. .. —
Walmsleys (Wigan) Ld. .. —
Ward, Thos. W. Ld. .. 59
Warner & Co. Ld. .. .. —
Wellman Bibby Co. Ld. .. —
Wellman Smith Owen Engineering Corporation Ld. .. 37
West Bromwich Spring Co. Ld. —
Westinghouse Brake & Signal Co. Ld. .. .. —
West's (Manchester) Ld. .. —
West's Piling & Construction Co. Ld. .. .. .. —
Westwood, Dawes & Co. Ld. —
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Widnes Foundry & Engineering Co. Ld. .. .. —
Wigglesworth, F. & Co. Ld. .. —
Wild, A. G. & Co. Ld. .. —
Wild, M. B. & Co. Ld. .. 65
Willcox, W. H. & Co. Ld. .. 56
Wincott, G. P. Ld. .. .. —
Wolseley Holdings Ld. .. 65
Wombwell Foundry & Engineering Co. Ld. 62
Wood, Hugh & Co. Ld. .. 11
Woodall-Duckham Construction Company Limited .. 18
Woodhouse, Joseph Chains Ld. .. .. .. —
Worsley-Mesnes Ironworks Ld. 62
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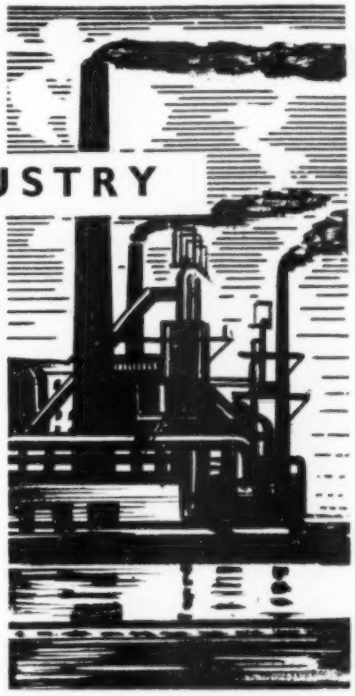

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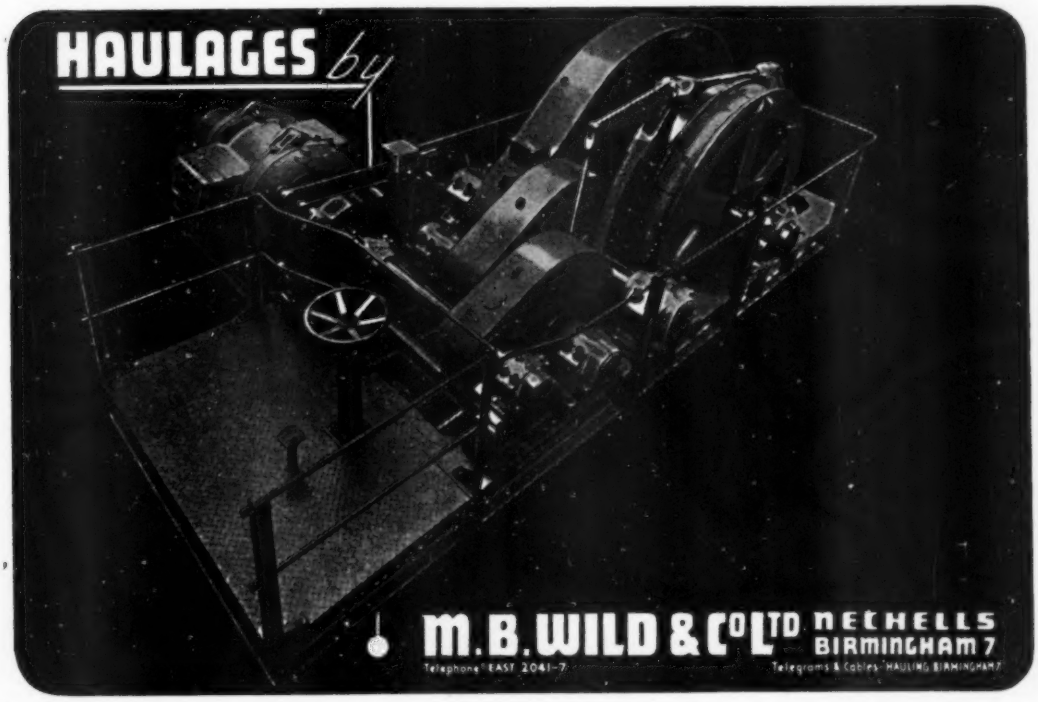

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Angus, Geo. & Co. Ltd. .. —
Appleby-Frodingham Steel Co. .. .. —
Armstrong-Whitworth (Metal Industries) Ltd. .. .. —
Armytage & Sons Ltd. .. 55
Arrol, Sir Wm. & Co. Ltd. .. —
Ashmore, Benson, Pease & Co. Ltd. .. .. —
Ashworth, E. & A. Ltd. .. —
Associated British Machine Tool Makers Ltd. .. .. —
Associated Electrical Industries Ltd. (Electronic Apparatus Division) .. —
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Atlas Copco (G.B.) Ltd. .. —
Aurora Gearing Co. (Wilmot North) Ltd. .. .. .. —
Austin, Jas., & Sons (Dewsbury) Ltd. 9
Auto-Klean Strainers Ltd. .. —
Automatic Coal Cleaning Co. Ltd. .. .. —
Aveling-Barford Ltd. .. —

Bagnall, W. G. Ltd. .. —
Bairds & Scottish Steel Ltd. .. 60
Barker, Davies & Co. .. —
Barlow & Chidlaw Ltd. .. —
Barnes & Bell Ltd. .. .. —
Barrow Ironworks Ltd. .. —
Bathgate, Richard A. .. —
Bayliss, Jones & Bayliss Ltd. —
Beckett & Anderson Ltd. .. —
Becorit (G.B.) Ltd. 40
Beldam Asbestos Co. Ltd. .. —
Belliss & Morcom Ltd. .. —
Belmos Co. Ltd. .. .. —
Beresford, Jas. & Son Ltd. .. —
Birkett, Billington & Newton Ltd. .. .. —
Birlec-Efco (Melting) Ltd. .. —
Birtley Engineering Ltd. .. —
Blacks Mining Equipment .. —
Blandford-Gee Cementation Co. Ltd. 61
Blantyre Engineering Co. Ltd. 10
Bolton Gate Co. Ltd. .. —
Bonser Tristram Ltd. .. —
Boyles Bros. Drilling Co. Ltd. —
Bradley, J. & Co. (Stourbridge) Ltd. .. .. —
Bradley Pulveriser Co. Ltd. .. —
B.R.D. Co. Ltd. .. .. —
Brightside Foundry & Engineering Co. Ltd. .. .. —
British Belting & Asbestos Co. Ltd. .. .. .. —
British Electrical Repairs Ltd. —
British Iron and Steel Federation .. .. —
British Jeffrey Diamond Ltd. 39
British Nylon Spinners Ltd. .. —
British Oxygen Co. Ltd. .. —
British Paints Ltd. .. .. —
British Resistor Co. Ltd. .. —
British Rollmakers Corporation Ltd. .. .. .. —
British Ropeway Engineering Co. Ltd. .. .. .. —
British Steam Specialties Ltd. 58
British Timken Division of the Timken Roller Bearing Co. .. .. —
Broadbent, Thos. & Sons Ltd. —
Brown, David Corporation (Sales) Ltd. .. .. .. —
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Brymbo Steel Works Ltd. .. —
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Ceag Ld. .. .. .. —
Cementation Co. Ld. .. .. —
Chloride Batteries Ld. .. —
Churchill Machine Tool Co. Ld. —
Clarke, Chapman & Co. Ld. .. —
Clark, Geo. & North Eastern Marine (Sunderland) Ld. .. 53
Clayton Equipment Co. Ld. .. 61
Cleveland Bridge & Engineering Co. Ld. .. .. .. —
Cohen Bros. (Electrical) Ld. —
Cohen, Geo. Sons & Co. Ld. .. —
Colvilles Ld. .. .. —
Conflow Ld. .. .. —
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Consolidated Pneumatic Tool Co. Ld. .. .. —
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Cooper, Jas. Milne & Co. Ld. —
Cooper Roller Bearings Co. Ld. —
Coppee Co. (Gt. Britain) Ld. —
Cotterill, Herbert Ld. .. —
Coulson, M. & Co. Ld. .. 58
Courtaulds Ld. .. .. .. —
Cowlishaw, Walker & Co. Ld. —
Cox & Danks Ld. .. .. —
Crawley Industrial Products Ld. .. .. .. 28 & 29
Cripps, R. & Co. Ld. .. .. —
Croda Ld. .. .. —
Crofts (Engineers) Ld. .. —
Crompton & Harrison Ld. .. —
Crompton Parkinson Ld. .. —
Crone & Taylor Ld. .. .. —
Crushing, Screening & Engineering Ld. .. .. —
Curtis, A. L. (Onx) Ld. .. —

Davenport Engineering Co. Ld. 59
Davey, Paxman & Co. Ld. .. —
Davis, John & Son (Derby) Ld. .. .. —
Davy & United Engineering Co. Ld. .. .. .. —
Davy & United Instruments Ld. .. .. —
Davy & United Roll Foundry Ld. .. .. —
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Dunlop Rubber Co. Ld. .. —
Dust Suppression Ld. .. —

Eagre Construction Co. Ld. .. —
Edge & Sons Ld. .. .. —
Eickoff, Gebr. .. .. .. —
Eimco (Gt. Britain) Ld. .. 51
Elastic Rail Spike Co. Ld. .. —
Elcordia Ld. .. .. .. —
Electrical Development Association .. .. —
Electric Furnace Co. Ld. .. —
Electroflo Meters Ld. .. .. —
Electro-Hydraulics Ld. .. —
Ellis, A. & Sons (Wakefield) Ld. 58
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Felco Hoists Ld. .. .. —
Fenner, J. H. & Co. Ld. .. 25
Fielding & Platt Ld. .. .. —
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Follsain-Wycliffe Foundries Ld. .. .. —
Foraky Boring & Shaft Sinking Co. Ld. .. .. —
Forster, T. S. & Sons Ld. .. —
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Fuel & Metallurgical Processes Ld. .. .. .. —
Fullerton, Hodgart & Barclay Ld. .. .. —

Gas Council .. .. .. —
General Electric Co. Ld. .. 22
General Refractories Ld. .. —
Gent & Co. Ld. .. .. —
Gibbons Bros. Ld. .. .. —
Gibbons (Dudley) Ld. .. —
Glover Bros. (Mossley) Ld. .. —
Glover, Wm. Jas. & Co. Ld. —
Goodall, Clayton & Co. Ld. .. —
Goodyear Tyre & Rubber Co. Ld. 49
Green, E. & Sons Ld. .. —
Green, Horace & Co. Ld. .. —
Greening, N. & Sons Ld. .. 8
Guest, Keen Iron & Steel Works .. .. .. —
Gullick Ld. .. .. .. —
Gutehoffnungshutte Sterkrade —

Hackbridge & Hewittic Electric Co. Ld. .. .. .. —
Hadfields Ld. .. .. .. —
Halesowen Steel Co. Ld. .. 62
Hall Bros. (West Bromwich) Ld. 60
Hallamshire Steel Co. Ld. .. —
Hanmade Conveyor Co. Ld. 45
Hardman, E. Son & Co. Ld. —
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Hayden-Nilos Ld. 1
Head, Wrightson & Co. Ld. .. —
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Hornsby & Goodwyn Ld. .. —
Hoy, Austin & Co. Ld. .. —
Hudswell, Clarke & Co. Ld. .. —
Humber Graving Dock and Engineering Co. Ld. .. 73
Hunslet Engine Co. Ld. .. —
Huntington, Heberlein & Co. Ld. .. .. —

Iliffe Books Ld. .. .. .. —
Imperial Chemical Industries Ld. .. .. —
Incandescent Heat Co. Ld. .. —
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International Construction Co. Ld. .. .. 16 & 17
International Harvester Co. of Great Britain Ld. .. 36
Intrafor Mining Engineers Ld. .. .. —

(*Continued on page 64*)

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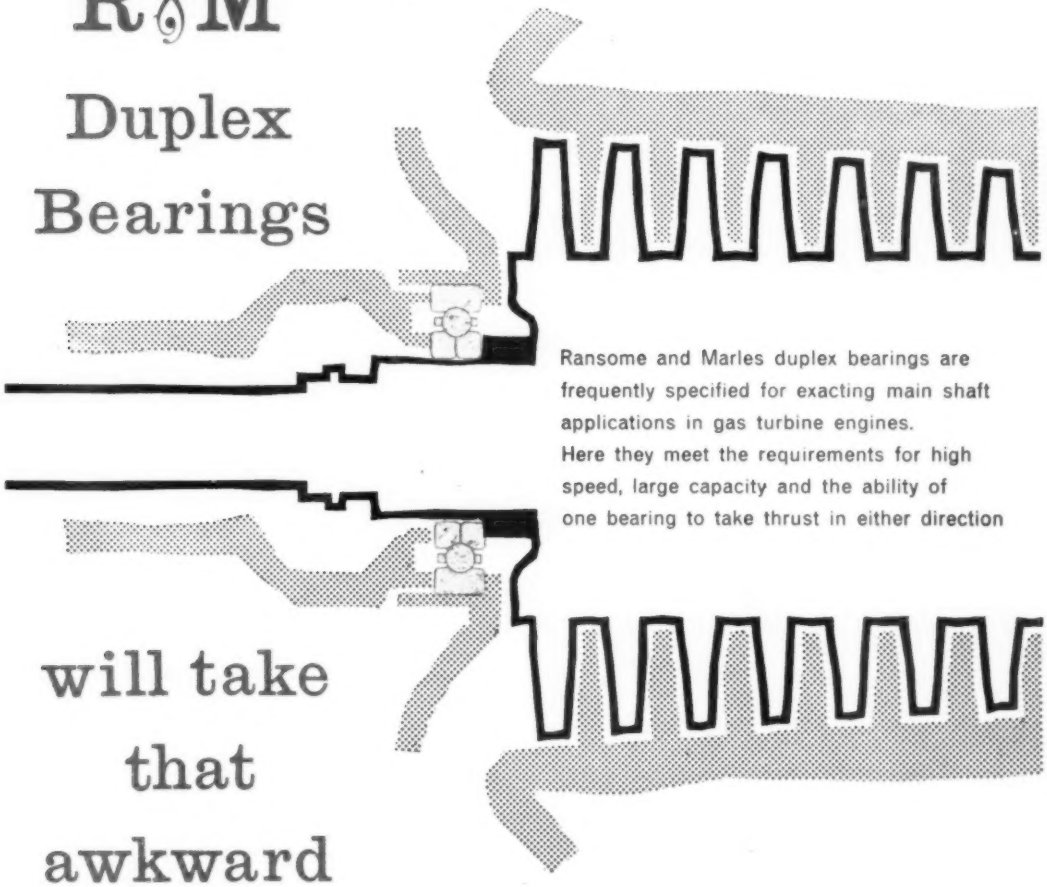

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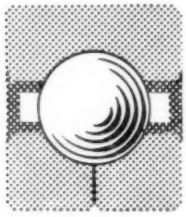

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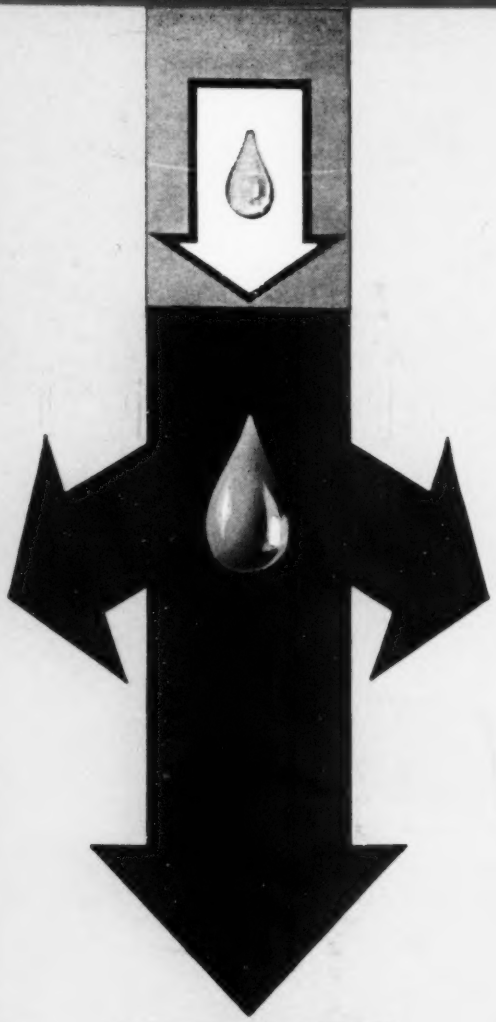

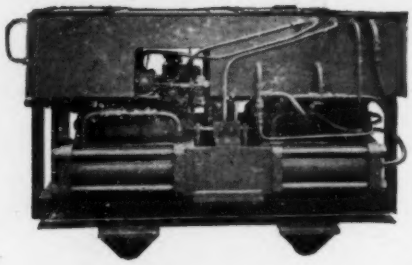

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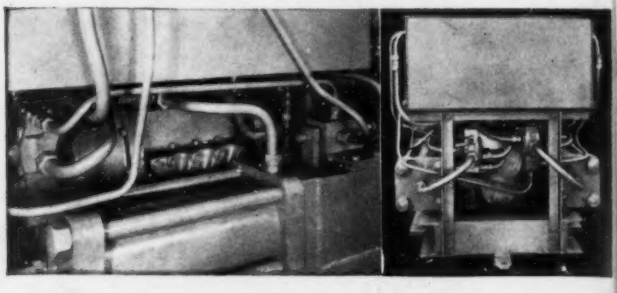

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